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CONTENTS

Pasteurization. *M. J. Rosenau* 51
Tuberculosis as an Industrial Accident. *John B. Hawes, 2nd* 55
Some Sidelights on the Thymus Vogue. *Joseph Garland* 59
Bronchoscopy in Acute Lung Abscess. *Leighton F. Johnson* 64
The Value of a Medical Library. *James F. Ballard* 65

MEDICAL PROGRESS

Cardiovascular Review. *Robert S. Palmer* and *Howard B. Sprague.* (To be continued.) 71

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Case 15021—Hypertension and Hematemesis. *Richard C. Cabot.* Case 15022—Treatment in an Obscure Gastric Case. *R. W. McAllester, A. V. Bock* and *D. F. Jones* 84

EDITORIALS

Why Are Malpractice Suits? 93
Chronic Cystic Mastitis 94
This Week's Issue 94

(Contents continued on next page)

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CONTENTS

(Continued)

THE MASSACHUSETTS MEDICAL SOCIETY

The Attitude of the Committee on Ethics and Discipline Regarding the Appearance of a Name in "The Expert". Walter L. Burrage. 96

THE CAMPAIGN CONDUCTED BY THE BOSTON MEDICAL LIBRARY AND THE MASSACHUSETTS MEDICAL SOCIETY 95

The Social Imagination. George E. Vincent 95

BOOK REVIEWS

A History of Pathology. Esmond R. Long 104

The Kahn Test. R. L. Kahn 104

Keeping Mentally Fit: A Guide to Everyday Psychology. Joseph Jastrow 104

Regional Anesthesia. Gaston Lebat 104

CORRESPONDENCE

Capital Investment in Medicine. R. G. Leland. 99

Changes at Pondville. George H. Bigelow 99

Comments on Annual Registration of Physicians and the Registration of Class C Graduates. Max Baff 98

The Cost of Pasteurizers. Hermann C. Lythgoe 98

Sir James Y. Simpson on the Cure of Contagious Disease in the Future. Wm. Pearce Coues 98

The Treatment of Erysipelas. M. J. Konikow. 99

MISCELLANY

Bogus Cancer Cures in England 103

Comparison of Disease Incidence in Connecticut with 1927 and Seven Year Average Week Ending December 22 97

The Health Playwriting Contest 70

Massachusetts Department of Education Division of the Blind 83

Undulant Fever 83

NOTICES 100

OBITUARY 100

RECENT DEATH 100

REPORTS AND NOTICES OF MEETINGS 100

SOCIETY MEETINGS 102

The Massachusetts Medical Society

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The New England
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PASTEURIZATION

BY M. J. ROSENAU, M.D.*

MILK is our most important food. It is the best single food. The exceptional value of milk is due to the fact that it contains the essentials of a well balanced diet; the quality of its protein is especially good, its fat favors growth, and it has a high calcium content in readily usable form. Milk, furthermore, is palatable, readily digestible, and is subject to a great variety of modifications. Even at present prices, it is one of the cheapest of the standard articles of diet and the most economical source of protein. Milk is a protective food, in that it guards against deficiency diseases when used in combination with other foodstuffs of either animal or vegetable origin.

The nations which have made liberal use of milk as a food have attained greater size, greater longevity, and have been much more successful in the rearing of their young than the non-milk-using peoples. They have been more aggressive and have achieved much greater advancement in literature, science and art. They have developed in a higher degree educational and political systems which offer the greatest opportunity for the individual to develop his powers. Such development has a physiological basis and there seems every reason to believe that it is fundamentally related to nutrition.

While good milk has done more than any other single food to obtain and maintain health, bad milk was formerly responsible for more sickness and deaths than perhaps all other foods combined. There are several reasons for this: (1) Milk conveys a greater variety of infections than any other food. Bacteria grow well in milk; therefore, a very slight infection may produce widespread and serious results; (2) of all foodstuffs milk is the most difficult to harvest, handle, transport and deliver in a clean, fresh and satisfactory condition; (3) it is the most readily decomposable of all our foods; (4) finally, milk is the only standard article of diet obtained from animal sources consumed in its raw state.

Fresh milk products may be quite as dangerous as the milk from which they are made. Milk laws which ignore milk products are incomplete from the sanitary side and will fail to accomplish their purpose from the economic side.

Milk is the only single substance whose sole function in nature is to serve as a complete food. It is a perfect food for the suckling of the same species. The milk of one mammal does not fit all the needs of the nursling of another kind: cow's milk is best for the calf, bear's milk for the cub, lion's milk for the whelp and mother's milk for the baby. After weaning, cow's milk is the best single food to promote growth and nutrition in children. All students of dietetics favor the free use of milk for growing children, who may well take as much as a quart a day, depending upon the amount and character of the remainder of the diet and also upon individual idiosyncrasies. Milk is quite as nutritious and beneficial whether taken as such or as part of various food preparations.

For the adult, milk has certain deficiencies although patients often do very well for weeks on an exclusive milk diet. As a sole article of diet for adults milk is too low in iron and lacks the reproductive vitamin; it has too much water and too little roughage. Adults should get about a pint of milk a day in the diet.

In view of the many advantages and few drawbacks, sanitarians unanimously encourage the production and use of pure milk and discourage the distribution and use of poor milk. It is the only food for which there is no effective substitute.

In view of the importance of the subject, Dr. George H. Bigelow, Commissioner of Public Health of Massachusetts, has requested me to write this article on pasteurization as a public health protection.†

Definition.—Pasteurization consists in heating milk to a temperature below that of boiling, holding it at that temperature for a definite time, and then chilling it rapidly. The time and temperature of pasteurization are designed to be sufficient to kill the harmful micro-organisms with the least possible effect upon the milk itself.

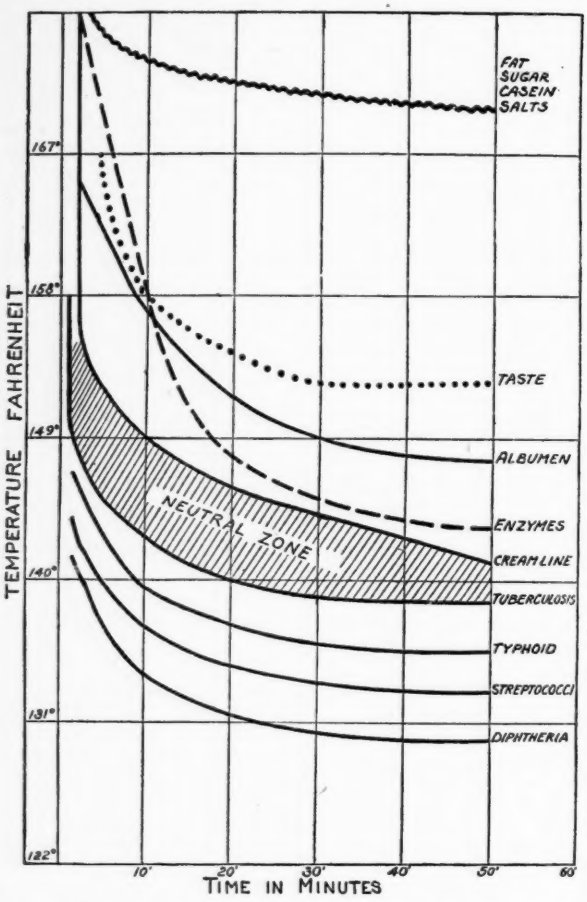
Time and Temperature.—Milk is best pasteurized by heating it to 142°-145°F. for thirty minutes.‡ This is based on the fact that it has been abundantly demonstrated that heating milk to 140°F. for twenty minutes is sufficient to kill all the non-spore-bearing milk-borne infections that are of concern to man. The added degrees of temperature and the extra minutes of

*For record and address of author see "This Week's Issue," page 94.

†The basis of this article is the chapter on Milk in my book "Preventive Medicine and Hygiene," (fifth edition) published by D. Appleton and Company, to which the reader is referred for further details.

‡Under Massachusetts statutes pasteurization is defined as heating milk to 140°F. to 145°F. for thirty minutes.

CHART I



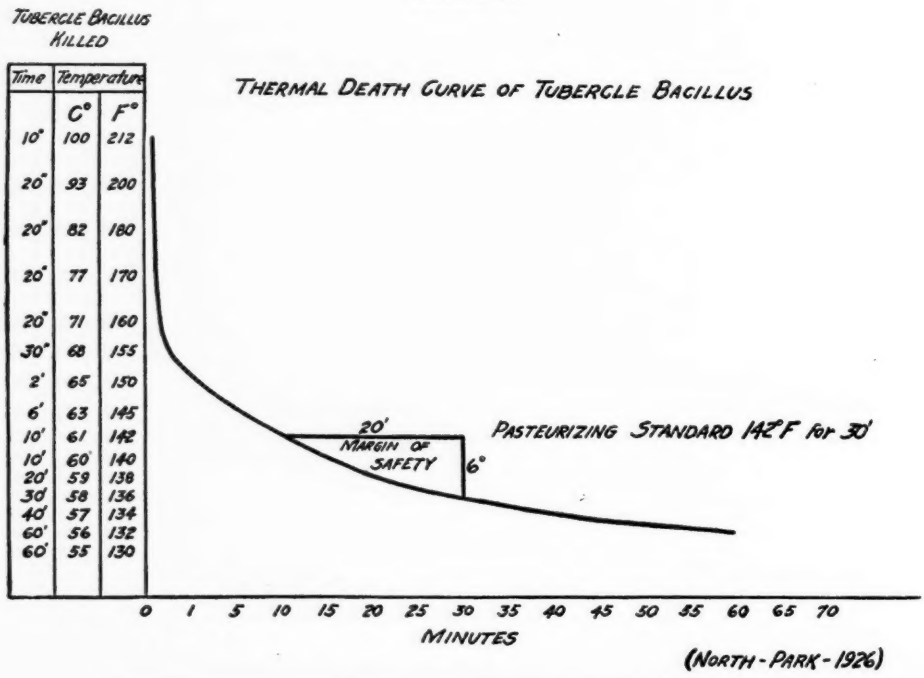
TIME AND TEMPERATURE FOR PASTEURIZATION IN THE NEUTRAL ZONE WHICH IS ABOVE THE THERMAL DEATH-CURVES FOR THE PATHOGENIC MICRO-ORGANISMS WITH MINIMUM INJURY TO THE MILK.
(*U.S. Pub. Health Bull. 147*, 1925.)

time are factors of safety necessary in commercial practice. It has been found by long experience in metropolitan cities handling enormous quantities of milk that 142°-145°F. for thirty minutes is safe and satisfactory. Milk that is pasteurized at this time and temperature protects the public health. There is no record of any milk-borne epidemic due to properly pasteurized milk. Heating the milk above 145°F. for a longer time is not objectionable from a sanitary standpoint, but an excess of heat is not necessary, in fact is undesirable because it destroys the cream line, alters the taste and otherwise changes the milk.

The Effects of Heat upon Milk.—The changes produced in milk by heat depend upon the degree of heat and the length of time of exposure. Milk heated to 145°F. for thirty minutes does not undergo any appreciable physical or chemical change. The boiling of milk, however, produces pronounced changes. In the main, these consist of a partial decomposition of the proteins and other complex nitrogenous derivatives; diminution of the organic phosphorus and an increase of inorganic phosphorus; precipitation of the calcium and magnesium salts and the greater part of the phosphates; expulsion of the greater part of the carbon dioxid; caramelization or burning of a certain portion of the milk sugar, causing the brownish color; partial disarrangement of the normal emulsion, and coalescence of some of the fat globules; coagulation of the serum albumin, which begins at 75°C.; the ferments are killed; some of the vitamins, notably C, are affected.

Boiled milk has a cooked taste which appears

CHART II



(FROM "STANDARDS FOR MILK PASTEURIZATION," *Am. J. Hyg.*, 7, 147. 1927.)

at about 70°C. This is due perhaps to the decomposition of certain of the proteins in the milk. The loss of certain gases also alters the taste, so that milk heated in closed vessels has a less pronounced flavor than if heated in open vessels.

Milk heated in the open air forms a pellicle which renews if it is removed. This scum forms when milk reaches about 60°C. It consists of:

Casein and albuminoid	50.86 per cent.
Fatty matter	45.42 per cent.
Ash	3.72 per cent.

Milk heated in closed vessels does not form a pellicle even when the temperature reaches the boiling point. It seems that this pellicle is due mainly to the drying of the upper layer of the liquid.

Heat causes a progressive decline in the hydrogen ion concentration of the milk as the temperature rises. Evidently, the heat modifies the balance of colloids in the milk.

It is claimed that heat influences the availability of calcium and phosphorus of the feeding mixture. It appears that the heat of pasteurization throws the calcium salts more or less out of solution, and thus they are made less readily available. This does not occur to the same degree in quickly boiled milk, which therefore has its advocates both here and abroad.

Object.—The only object of pasteurization is to destroy the micro-örganisms which are sometimes found in milk and which may cause infection in man.

Milk-Borne Diseases.—The following diseases are known to be milk-borne: tuberculosis, typhoid fever, scarlet fever, diphtheria, septic sore throat, milk sickness, foot-and-mouth disease, dysentery and other gastro-intestinal troubles, especially in infants.

To this long list has recently been added epidemic arthritic erythema. Three small outbreaks of infantile paralysis have been traced to raw milk.

Malta fever is transmitted to man through goat's milk. There is an extraordinary relationship between Malta fever and contagious abortion of cows, which is due to the Bacillus abortus. This bacillus is often found in milk, even in milk of the best quality. There are few herds free of this infection and the evidence is growing that strains of the Bacillus abortus are harmful to man. Such cases, now called undulant fever, are usually mistaken for typhoid fever or rheumatism.

Pros and Cons.—There are two sides to the question of pasteurization which must be considered. It has its advantages and its disadvantages.

Pasteurization prevents sickness and saves lives. Pasteurization is not ideal, but only an expedient. It is advocated because milk is apt to convey the viruses of a number of diseases harmful to man. Pasteurization effectively prevents this hazard. It implies precaution, protection and prevention. It is the best insurance both for the industry and the consumer and the simplest, cheapest, least objectionable and most trustworthy method of rendering milk safe.

Pasteurization Does Not Atone for Filth.—Pasteurization does not claim to replace sanitation and common decency. It cannot atone for filth and should not be used as a redemption process. Stale, weak and dirty milk is still stale, weak and dirty after it has been pasteurized. A pure milk is better than a purified milk. However, no one should drink raw milk that cannot be guaranteed by the health officer as safe and free from danger. Even certified milk or milk of equally high character is only reasonably safe without pasteurization. Less than one per cent. of all the milk found upon the market is certified. Therefore, raw milk of this honor class is not a public health problem of any magnitude, although it has been responsible for outbreaks of diphtheria, scarlet fever and other diseases.

Pasteurization and Nature's Danger Signal.—It is sometimes alleged that pasteurization does not destroy nature's danger signal—souring. Milk pasteurized at the temperature recommended (142°-145°F.) sours as a result of lactic acid fermentation just as raw milk does, although somewhat more slowly. Nature has no danger signal for infected milk. Milk may be teeming with typhoid bacilli and other pathogenic micro-örganisms without its taste, odor or appearance being changed.

Pasteurization and the Vitamins.—The early impression that milk must be rich in all the vitamins has met with some disappointment.

Milk, butter and cream are rich in *vitamin A;* in fact, they are the chief sources of this vitamin in the diet. Vitamin A favors growth and nutrition and its absence induces xerophthalmia. It is particularly resistant to heat, drying and age.

Milk contains *vitamin B,* the antineuritic vitamin, which protects against beriberi, but the amount is uncertain. This vitamin also resists heat, drying and age.

Milk has but a moderate and variable amount of *vitamin C.* The antiscorbutic property of milk is directly proportional to the amount of this vitamin in the feed of the cow or the diet of the mother. It is a much more fragile vitamin than A, B or D, and readily affected by age, oxidation, heat and other influences. Orange and tomato juices are valuable and available sources of this dietary factor.

Milk contains antirachitic properties, *vitamin D,* but neither cow's milk nor mother's milk can be depended upon to protect growing infants against rickets. It is heat resistant and is not affected by drying or age. It is particularly abundant in cod-liver oil.

Milk contains little of the reproductive vitamin of Evans and Bishop, *vitamin E.*

Milk probably does not contain P.P., the

pellagra preventive vitamin. It is absent from butter.

Relation of Pasteurization to Scurvy and Rickets.—The amount of antiscorbutic property, vitamin C, found in milk depends upon the quantity contained in the feed of the cow. Stall-fed cows in winter furnish a milk almost devoid of antiscorbutic property. Experiments have shown that the temperatures of pasteurization recommended decrease this property in milk about one-half. In any case, cow's milk cannot be depended upon to protect children against scurvy and they should therefore receive orange juice or tomato juice, whether the milk is raw or pasteurized.

Milk at best has but moderate antirachitic property, so-called vitamin D, which is not affected by heat. Rickets therefore cannot be laid at the door of pasteurization. It may readily be prevented by the use of cod-liver oil and the benefits of sunshine.

Pasteurization and Digestibility.—The heat of pasteurization does not alter the taste, appearance or digestibility of milk and does not appreciably diminish its food value, except that there may be a diminution of its antiscorbutic property, which in any case should be offset by the use of orange juice or tomato juice. In fact, pasteurization tends to make the curds smaller and in this way perhaps easier to digest.

Pasteurization and Toxins.—Pasteurization is sometimes objected to because it does not destroy heat resisting toxins which are sometimes supposed to be in milk. The occurrence of such poisons is a mere assumption. Even if they exist in milk, they would be in the raw milk as well as as in the heated milk. The true bacterial toxins, such as those of diphtheria, tetanus and botulism, are killed at 80°C. for thirty minutes.

Pasteurization and Clean Milk.—One objection to pasteurization has always been the claim that it will put back the cause of clean milk and good dairy methods, because pasteurization will make cleanliness unnecessary and will put carelessness at a premium. Experience has proven the fallacy of this argument; in fact, the general milk supply of large cities has steadily and materially improved despite pasteurization.

Pasteurization and Inspection.—Pasteurization is not proposed as a substitute for, but as an adjunct to inspection. Inspection gives us cleaner and fresher, but not necessarily safe milk. Inspectors cannot be present all the time, and furthermore, even if they were Pasteurs, they could not see missed cases and carriers. Pasteurization destroys the dangers inspection cannot see. The combination of inspection and pasteurization corresponds in all respects to the modern principles of furnishing a safe water supply to a large city. The watershed, through inspection, is kept as clean as practicable, but the water is filtered or purified to protect the consumer.

Pasteurized Milk for Children and Adults.—There can be no more objection to the heating of milk for the use of adults or children above the age of one year than there is to the cooking of meat.

Pasteurized Milk for Infants.—Infants should receive breast milk. There is no adequate substitute. When this is not possible, they should have the best and freshest cow's milk that can be obtained. Whether such milk is to be pasteurized, modified or otherwise treated rests with the pediatrician. Pasteurization has the well-nigh unanimous endorsement of sanitarians and pediatricians.

Care of Pasteurized Milk.—Pasteurized milk must be handled at least as carefully as raw milk. It is just as apt to become infected if exposed. Bacteria grow even more rapidly in heated than in fresh raw milk. The germicidal properties of milk are destroyed by heating above 158°F., but are little influenced at 142°-145°F. for thirty minutes. There is a plentiful lack of understanding concerning the relative growth of bacteria in raw or heated milk. From a practical standpoint, this question can be disregarded, for the pathogenic germs that concern us particularly are just as harmful if taken in raw milk as in heated milk.

Pasteurized milk should be bottled by machinery immediately following the process, kept cold and delivered promptly. The bottles should first be disinfected with steam or scalding water. All milk, whether raw or pasteurized, should be kept *clean, cold* and *covered.*

Methods of Pasteurization.—There are five methods of pasteurizing milk: (1) the flash method, (2) the holding method, (3) continuous flow, (4) the vat method, and (5) in the final container.

Pasteurizing machinery must be well designed, properly run and kept clean and in good order. There should be automatic temperature control and automatic temperature recording devices and the records should be kept for official inspection. From time to time the thermometer and thermoregulators should be standardized and the process controlled by physical and bacteriological methods to insure its effectiveness.

Official Control.—Pasteurization is too important a public health measure to leave to individual caprice. The process should be under official supervision. The sanitary code should clearly define the requirements, and pasteurized milk should be labeled as such, or merely "heated milk," stating the degree of heat and the length of time and the date on which the process was done. Action for misbranding may be taken for milk labeled "pasteurized" but which has been processed by improper or incomplete methods. Milk should not be pasteurized twice.

Milk should be pasteurized at some central station where it may be done scientifically under official surveillance. In other words, it should be done for the householder just as in the case of central water purification plants. If

water needs filtration or chlorination, experience teaches that it is inadvisable and expensive to depend on the householder to carry out the process. The same is true with pasteurization.

The Essential Requirements for a Safe and Satisfactory Milk Supply.—1. Cows should be healthy and free especially from communicable infections, or any febrile disease, or inflammatory condition of the udder.

2. All persons who in any way come in contact with the milk or milk apparatus should be free from communicable diseases and not be carriers. A minimum of human contact should be insisted upon.

3. The milking should be done in clean rooms, the udders washed; the hands of the milker should be clean and dry.

4. The milk should be received into clean, sterilized pails with a small mouth so as to keep out dust and dirt which falls from the udder and belly of the cow. If strainers are used they should be cleaned and boiled morning and evening. Cans and pails should be cleaned with washing soda or alkaline powder (not soap), rinsed in clean water and then steamed or boiled.

5. The milk should be chilled to 50°F. or under at once, and kept protected from flies, dust, odors and contamination in a clean milk house until collected. A wooden paddle should not be used to stir the milk. If stirred a metal paddle is preferable.

6. The milk in transit to the city should likewise be kept protected and cold, not higher than 50°F., and guarded against tampering en route. The lower the temperature the easier it will be to keep the bacterial count down.

7. All apparatus at the city dairy, such as tanks, clarifiers, separators, pasteurizers and bottling machines, should be kept scrupulously clean and sterilized daily with steam.

8. PASTEURIZATION at 142°-145°F. for not less than thirty minutes should be followed by rapid chilling and the milk kept below 50°F. until delivered to the consumer. Milk and cream used for making milk products should also be pasteurized. The need here is just as great as for milk itself.

9. The pasteurized milk should be bottled by machinery in sterilized bottles, well sealed; and delivered promptly to the consumer.

10. All bottles and cans, after use in city delivery, should be washed and sterilized before being returned to the producer in order to prevent the conveyance of infection to the dairy or country farm.

11. The milk must be graded. In this way the producer is paid for care and cleanliness and the consumer has a ready means of knowing the sanitary character and nutritive value of the milk he purchases. The health officer should make frequent bacterial counts, and also sanitary surveys, for the purpose of grading.

12. A sanitary code based upon good milk laws, which include milk products, should be enforced.

13. A system of licensure, inspection and education to insure the above requirements should be followed.

TUBERCULOSIS AS AN INDUSTRIAL ACCIDENT

BY JOHN B. HAWES, 2ND, M.D.*

TUBERCULOSIS as an industrial accident may not be regarded as a subject of strictly medical or scientific nature by many physicians but it is one, however, that cannot be avoided. Ever since the introduction of the first workman's compensation act some fifteen or more years ago, industrial medicine and industrial diseases and accidents have played an increasingly large part in the practice of a very large group of physicians. The question of the relation of the workingman to accident and injury, in these days of labor unions, benefit associations, industrial insurance and compensation acts, is a most important one. The meaning and interpretation of the words "industrial accident" have been changed, amplified or again restricted according to the rulings of the various states so that at present the matter is in great confusion. In this paper based on a series of cases in which I have testified during the past ten or more years, I shall try to clarify the situation to some extent at least and by so doing hope to make it easier for others when called upon, as they are bound to be sooner or later, to testify in such cases.

The Workman's Compensation Act of Massachusetts (General Laws, Chapter 152), which, in turn, was based on a similar act in England of some years previous, is not essentially different from similar acts in other states of this country. The interpretations, however, of certain terms and phrases occurring in this act and in those of other states may and do vary greatly. According to the Massachusetts Act an employee who receives "a personal injury arising out of and in the course of his employment" is entitled to compensation. The interpretation of this sentence, and particularly the words "personal injury" and "out of and in the course of", is of the greatest importance and likewise causes the greatest confusion and difference of opinion. Occupational diseases as injuries are not specifically mentioned in this or, indeed, in other acts, but are brought in

*For record and address of author see "This Week's Issue," page 94.

through the expansion and development of the term "personal injury". One of the earliest decisions and one of the greatest importance in this connection was the William Hurle case (217 Mass. 223, Feb. 28, 1914). This man developed an optic neuritis through the inhalation of poisonous gases in the necessary course of his work. Damages were awarded to the plaintiff, the court saying, "There is nothing in the Act which leads to the conclusion that 'personal injury' was there used in a narrow or restricted sense".

Another important case bearing closely on this subject was that of Otto Johnson (217 Mass. 388, April 3, 1914), in which an employee grinding lead for twenty years finally became incapacitated from lead poisoning. The court stated in this instance, as in the Hurle case, "Under the Act 'personal injury' is not limited to injuries caused by external violence, physical force or as the result of accident in the sense in which that word is commonly used and understood, but under the statute is to be given a much broader and more liberal meaning, and includes any bodily injury". In this respect the English Workman's Compensation Act differs from ours because that Act applies only to "personal injury by accident". The court further stated that "it is clear that 'personal injuries' under our act include any injury or disease which arises out of and in the course of the employment which causes incapacity for work and thereby impairs the ability of the employee for earning wages".

On the other hand, the Supreme Court of Massachusetts has ruled against certain injuries of a more or less functional nature, such as a cigar maker's neurosis or other conditions due to faulty posture, etc. In one of these cases involving a cigar maker's neurosis, commenting on the Act itself and the term "personal injury" the court said, "The act relates to industrial conditions. It has to do with employment of labor. It affords no relief against general disease. It is not a scheme for health insurance. It deals only with personal injuries *following as an immediate result* from the employment as its direct cause. A disease of mind or body which arises *in the course of* employment with nothing more, is not within the Act. It must come from an injury, although that injury may not be a single definite act but may extend over a continuous period of time. Poisoning, blindness, pneumonia or the giving way of the heart muscles, all induced by the necessary exposure or exertion of the employment, fall within well recognized classes of personal injuries. On the other hand the gradual breaking down or degeneration of the tissues caused by long and laborious work is not the result of a personal injury within the meaning of the Act. The disease must be or be traceable directly to a personal injury peculiar to the employment. It is difficult to establish between what is a personal injury within the act, on the one hand, and simple disease on the other. But personal injury and disease are not synonymous. One does not include the other . . . although they may overlap in some instances".

There are few employments which, pursued without due regard to the laws of health and the requirements of a correct mode of life, may not invite some form of disease. In the above statement the court admitted that it went further in its interpretation of this matter than many other courts and indeed quoted similar cases where an opposite opinion had been handed down. I advisedly give emphasis to this point, one that should be borne in mind, that a personal injury must arise not only in the course of the employment but also it must arise *from* it.

I have quoted at length from the decisions of the court in these cases because a fundamental point is involved and is discussed wisely and well. Before testifying as an expert in such cases it would be well to familiarize oneself with the substance of the above quotation. To summarize the whole matter, the man who breaks his leg in the course of his work suffers a personal injury and in no less degree the stone cutter who develops pneumonoconiosis or phthisis after years of stone cutting does likewise. On the other hand, a day laborer who gets worn out after years of arduous work does not suffer a personal injury any more than the clerk who comes down with consumption while working in the bank or store. There are, of course, many border-line cases where it is extremely difficult to decide. Some of these I shall comment on later. In this connection I would call physicians' attention to the interpretation of the words "possible" and "probable". In almost every case where a doctor is called upon to testify as to the causal relationship between an employee's work or accident and a subsequently developing pulmonary tuberculosis he will be asked whether there was a *possible* or a *probable* connection between the man's occupation and his disease. In answering this question it is well to bear in mind that industrial accident boards, and indeed the law in general, are not interested in things that are merely *possible,* but only in those that are *probable* or, better still, *positive* factors in the case.

I am basing my remarks in this paper on seventy-six cases where tuberculosis of the lungs was the "personal injury" involved and for which compensation was demanded and in which I have appeared before the Industrial Accident Board of Massachusetts or elsewhere during the past two or three years. The sexes and ages of these patients are unimportant. In eleven out of the seventy-six there was a direct exposure to tuberculosis for many years through another member of the family. Of the

seventy-six cases twenty-seven were granite cutters with an average length of time at work in this industry of approximately thirty years. In these twenty-seven it is, of course, evident that there is a direct relation between the occupation and the development of the tuberculosis which accompanied or followed the pneumonoconiosis. That these cases typify tuberculosis as an industrial accident needs no argument.

In addition to this group of twenty-seven granite cutters there are twelve others concerning which I likewise feel that there can be no doubt as to the fact that the tuberculosis in each one constituted a true personal injury. These I will mention briefly. In each there was either a fairly serious accident, such as a bad fall or a burn, or else some sudden severe unaccustomed physical strain that was followed at once by a hemorrhage, or, as in three cases, by an acute pneumothorax of tuberculous origin. In one of these the train of events, though definite, was prolonged over several months. This man in question fell thirty-five feet from a staging, receiving a broken ankle and other severe injuries and was in the hospital three and a half months, at the end of which time he developed a cough with tubercle bacilli in his sputum. Some months later he died.

In another case a man was shoveling wet snow, the severe exertion of which apparently caused an acute pneumothorax, while another man cranking a car had the same thing happen. This makes a total of thirty-nine cases out of seventy-six concerning which there can be no very real doubt as to the relation between the accident or occupation and the subsequently developing tuberculosis.

On the other hand, there are twenty cases in which I believe there is likewise no possible doubt that there is no relation between the accident or occupation and a subsequently developing tuberculosis of the lungs. In fourteen of these twenty the reason for this was that the diagnosis of tuberculosis claimed by the plaintiff was not substantiated, no tuberculosis being found either clinically or by x-ray. The correct diagnosis in these fourteen cases was chronic bronchitis, chronic asthmatic bronchitis, bronchiectasis, or congenital or acquired heart disease, while in a certain number the symptoms were apparently due to a straight neurosis. One man, whose work consisted in glass-cutting, claimed that the particles of glass had been inhaled into his lungs thereby causing his symptoms. On investigation it was manifestly impossible that any appreciable amount of glass dust could have gotten into his lungs. Another man worked in a room where soapstone was used to powder inner tubes. He claimed that it was this soapstone which caused his lung trouble. In the first place I was unable to find that he had any lung trouble, while, on investigating the plant, I could see no evidence of any appreciable amount of dust. A third man worked in a cartridge factory where he handled 20 per cent. sulphuric acid and claimed that the fumes from this acid caused his tuberculosis. I investigated this plant and could find no evidence of these fumes, handled the acid myself and found it harmless. Although he had a mild inactive tuberculosis, it certainly was not caused by acid fumes. Another man, whose occupation was making piano wires, alleged that the dust from the copper wire had gone into his lungs, thereby causing an irritation which, in turn, reactivated his tuberculosis. In a detailed examination of his work there was no evidence of any dust whatsoever. In another case the man was engaged in polishing small articles with a belt of sandpaper. While there was a certain amount of dust in connection with this occupation, the dust-removing apparatus was of the best and in addition the period of exposure to the very small amount of dust present was too short to have had any effect in his particular case. It is perfectly evident to anyone having had experience in this work that tuberculosis is often used as a common diagnosis on which to base claims for compensation in far too many instances. The first point to be decided in every instance is to make sure that we are dealing with tuberculosis in any clinical form whatsoever.

Finally, there is a third group of border-line cases. This group is of real importance so that I shall take them up more in detail.

I. A young man of twenty-two, with a previous history of pleurisy with effusion which antedated his accident by six months, strained his back severely in the course of his work. This was followed by a fever and three months later by a recurrence of the pleurisy with effusion, for which he was tapped. The clinical diagnosis in this case was chronic pulmonary tuberculosis and pleurisy with effusion.

While, in my opinion, it is extremely doubtful whether the back strain had any connection with the recurring pleurisy with effusion, there is, of course, a *possibility* I would willingly admit. I would not admit that it was a *probability*, however. Again I would call attention to the fact that in these cases we are dealing with probabilities and not possibilities.

II. An auto salesman of twenty-six in March, 1924, entered a sanatorium for tuberculosis, from which he was discharged with the process apparently arrested a year later, in March, 1925. In August, 1926, while feeling perfectly well and working right along, soon after changing an automobile tire he raised a small amount of blood. He was examined the next day and found to be in perfectly good condition and four months later when I examined him I could find no evidence of any active tuberculosis.

Here again it is open to argument as to whether the exertion of changing an automobile tire could have been a sufficient cause of this slight hemorrhage, or, if it was the cause,

whether or not it incapacitated him or did him any harm.

III. An engineer of fifty-eight, in August 1923, fell and broke three ribs. After being laid up three weeks he went back to work, but immediately had copious hemorrhages from his lungs, lasting four days. Two or three months afterwards he again went back to work and continued at work until *three years later* when, in August 1926, he had more hemorrhages.

Here is a case of chronic pulmonary tuberculosis with a history of fourteen years' duration, a severe accident to the chest in 1923 followed by hemorrhages and again by more hemorrhages after three years of perfect health. In this case I was quite unwilling to admit that the accident in August 1923 had anything whatsoever to do with the hemorrhages in August 1926.

IV. A man of fifty-four whose *chief* occupation was that of janitor, but who worked occasionally using an emery wheel, claimed that the dust from the emery wheel had caused a quiescent pulmonary tuberculosis to become active. By x-ray and clinically he showed a mild chronic pulmonary tuberculosis but no evidence of pneumonoconiosis.

With only an occasional use of the emery wheel over a comparatively short period of five years I can see no relation between his occupation and the mild tuberculosis and willingly testified to this effect.

V. A man who, for ten years, had been engaged in handling molten metal developed a certain amount of lung trouble, which he claimed came from the fumes developed in the process of his work. On examination it was found that these fumes were conspicuous by their absence and that what little fumes there were, were of an innocuous nature and, furthermore, that the lung condition was not pulmonary tuberculosis but chronic asthmatic bronchitis.

For some reason that I do not know this was one of the most hotly disputed cases that I have attended, although, in my opinion, there was absolutely no basis for a claim for compensation.

VI. A coal heaver, whose business it was to load soft coal on a truck at the chutes and to deliver it to its destination, claimed that the coal dust he had inhaled during the six years he had been engaged at this occupation aggravated his chronic tuberculosis and caused it to become active.

In the first place, coal dust, while not particularly pleasant to breathe, contains little or no silicon and is not a dangerous form of dust. In addition to this, this man had been engaged in this work for only six years and his exposure to the dust came practically only when the coal was being loaded into the chute as coal had to be wet down before it was delivered. Although this was a needy and a pathetic case and the diagnosis of a well marked tuberculosis was clear, I do not believe that inhalation of coal dust was any factor. I frankly admit, however, that I would not select such an occupation for any of my patients with tuberculosis, but it would be rather because the work was too arduous than because of the dust.

VII. A chauffeur was pinned against a wall by a crate so that his chest was strained and had to be strapped up. At this time signs of an old tuberculous process in the spine were found, although this had never been the cause of any symptoms, and at the same time an x-ray showed an old inactive process in the lungs. From the time of the accident, on March 3, 1925, he did no work until November, 1925, when he went to work for two weeks but had to stop. He worked again for a short period after December, 1926, and then claimed that he was unable to work any further.

I find it very difficult to believe that there was any relation between a comparatively slight accident to the chest in March, 1925, and the very slight lung condition which had been, and in my opinion was still an entirely quiescent one.

VIII. A man whose occupation was steel grinding claimed that the metal dust had reactivated his tuberculosis. From his story it sounded as if such might be the case. On investigating the plant, however, I found that only a small part of his work was confined to steel grinding and that the workers were all very well protected from what little dust of any kind there was, steel or otherwise.

IX. A longshoreman, who, some years previous, had taken sanatorium treatment for tuberculosis and had been discharged with the disease arrested, had been working for nine months in apparently perfect health, doing hard, physical labor, when in October, 1924, he struck and wrenched his right knee. He worked for two days after this and then had to give up. The knee was operated on a year later, in October, 1925, and in the spring of 1926 active tuberculosis of the lungs developed. He went steadily down hill and died in July, 1926.

Although this is, of course, open to argument, I find it difficult to see how a comparatively minor accident which took place in October, 1924, could have any direct effect on a tuberculosis which did not develop into activity until the spring of 1926. It could be argued that there was a fairly definite chain of events going on from the original accident, slight as it was, until his death in 1926. Although this argument is a perfectly proper one, I was not willing to accept it in this case.

X. A young man of twenty-seven, whose brother had previously died of tuberculosis, while in the course of his work as an emery wheel maker, developed phthisis and died. He had worked at this occupation for nine years but only during a comparatively short part of this time had he been working steadily in those parts of his work in which he was exposed to dust.

It is a well-known fact that for the lungs to become damaged by means of silicon, a component of emery wheels, exposure has to be prolonged,—at least 12 to 15 years. On the other hand, there was undoubtedly a pre-ëxisting tuberculosis, so that it might have caused its reactivation in a much shorter period. This is an interesting and debatable case in which opinions might well differ.

XI. A clerk of forty-four, with pulmonary tuberculosis which had reached a fairly advanced stage

without his knowing it, claimed that his work in a damp building as the head of a truck automobile department was the cause of his tuberculosis becoming active.

In my opinion, his disease had followed its normal course with, in his case, a normal result so that there was no relation between his work and his illness. Here the tuberculosis arose "in the course of" but not "out of" his employment.

XII. A man of thirty with a mild tuberculosis was engaged in packing and unpacking china in barrels filled with straw. He claimed that the dust he inhaled at this work was the cause of the reactivity of his tuberculosis. I investigated the premises personally and quite agreed that there was an immense amount of irritating dust which tended to make one cough and sneeze.

This is a border-line case and I am rather inclined to feel that although the dust did not affect the lungs directly, it might have been a factor in reactivating his tuberculosis.

XIII. A man who had spent nine years as an emery wheel grinder, in April 1927, developed influenza, after which his old tuberculosis became active.

He claimed that it was the dust from his occupation as a grinder rather than the influenza which was the cause of his incapacity. His work was involved in making the newer forms of emery wheels in which pure silicon is not used and accordingly the dust was infinitely less dangerous and irritating than if he had been exposed to the dust containing pure silicon, as is the case of the granite worker. I believed and testified to the effect that the duration of his work and the nature of it were not such as to be factors in his case and that it was the influenza which was the striking and chief cause in reactivating his tuberculosis.

XIV. A woman with a chronic pulmonary tuberculosis of which she was unaware, and which had caused her no symptoms in the slightest, when feeling perfectly well slipped on a banana peel and fell. Curiously enough, after this she went steadily down hill and became seriously sick.

I feel that the fact that she was told she had tuberculosis played a certain part in this and that eventually she would have developed an active process in her lungs regardless of any accident. On the other hand, no one can possibly deny the fact that the accident, slight as it was, might have been, and in this case apparently was, the deciding factor in causing her tuberculosis which had hitherto been latent to become active.

In this last group of fourteen cases, in each one it is evident that the decision as to whether or not the tuberculosis constituted an "industrial accident" arising "out of and in the course of" the employment rested with the court or the industrial accident board before which the case was heard. Opinions as to granting compensation or not are bound to differ, depending on how the evidence is presented and on a strict or a liberal interpretation of the law. It is in such instances as these that a knowledge of the ultimate aims and objects of our compensation laws will be of great help to the physician called upon to testify. I hope that in this discussion I have made it easier for the medical profession to obtain such information concerning a subject that is bound to become of increasing importance.

SOME SIDE LIGHTS ON THE THYMUS VOGUE

BY JOSEPH GARLAND, M.D.*

THE debate concerning the thymus gland has proven to be a most perplexing controversy, the settlement of which has eluded medical science since Felix Plater first described a supposed thymic death in 1614. This organ, the physiology of which is but imperfectly understood, and even the anatomy of which, at least so far as its size is concerned, has permitted of new revelations in recent years; an organ which undergoes surprisingly few pathologic changes, has, in the penetrating light of roentgenology, lately assumed a new importance,—an importance which the facts do not seem wholly to justify. The combined efforts of pediatrist and roentgenologist have, indeed, caused the thymus to cast a shadow upon the land. In awe of this simple lymphoid structure the surgeon with-holds the knife; the mother does not hold her babe to be entirely safe until the x-ray film has shown, with curious finality, that there is no danger of a sudden and spectacular demise.

It is apparent, from a cursory survey of the literature and from observation of the current trend of thought, that a degree of confusion exists in the medical profession itself as to the difference between simple hyperplasia of the thymus gland and so-called status lymphaticus or status thymico-lymphaticus. To the average person enlargement of the thymus gland, as revealed by the x-ray, is a dreadful and mysterious condition, offering to its possessor the shocking possibility of a choice between being strangled to death by the encroachment of a moderately congested gland, of dying while under the influence of an anaesthetic, or of being found dead in bed. In the event of either of the latter two emergencies, or of one resembling the first, the thymus gland is generally blamed.

Simple enlargement of the thymus gland may, presumably, cause symptoms due to the pres-

*For record and address of author see "This Week's Issue," page 94.

ence of a tumor mass in the mediastinum. Brassy cough, noisy respiration and attacks of cyanosis, with or without dyspnoea may accompany such an enlargement, and it is possible that, in extreme cases, convulsions may occur. It is doubtful if these attacks ever cause death; certainly such an outcome must be extremely rare. The condition known as status lymphaticus—a condition which probably does occur, although rarely—has one feature in common with simple enlargement of the thymus. In this condition general hypertrophy of the lymphoid tissue occurs, and the thymus gland, being a lymphoid structure, may share in it. Recent investigations, which will be mentioned later, point towards a possible sufficient reason for the sudden deaths which are supposed to occur in status lymphaticus as a result of ordinarily insufficient causes.

Some investigators doubt the existence of status lymphaticus as a definite entity, believing that adequate cause elsewhere may be found for these deaths which are attributed to it.

The thymus gland[1] arises in man as a paired ventral outgrowth from the entoderm of the third and fourth branchial clefts, the main portion coming from the third. Two types of cells occur in it, lymphocytic in the cortex, epithelial throughout, less marked in the medullary portion. The original epithelial cells tend to arrange in concentric fashion to form the Hassal bodies, which are not vestigial structures but are constantly being newly formed from hypertrophic epithelial cell complexes. J. A. Hammar has contributed the best studies on the growth and involution of the gland, giving the following weights at various ages:

	Grams
New Born	
6 to 10 years	13.26
11 " 15 "	26.1
21 " 25 "	37.52
56 " 65 "	16.08
66 " 75 "	6.0

Enlargement of the gland occurs in 75 to 79 per cent. of cases of exophthalmic goitre, and is frequently observed in Addison's disease, acromegaly and eunuchoidism.

Without characteristic changes, according to MacCallum, it is generally assumed to be enlarged in the vague condition of status thymicolymphaticus. There is no proof that it is concerned in the development of status lymphaticus or in sudden death, but rather is it more logical to believe that it is the incomplete development of the secondary sexual characteristics which causes failure of the gland to undergo involution.

Status lymphaticus MacCallum describes as a general constitutional abnormality amounting to a physical inferiority. In men there is incomplete development of the secondary sexual characteristics with a tendency towards the feminine type. In women the thorax and extremities are slender, the genitals hypoplastic, menstruation irregular or absent, and there is a tendency to hair on the face. In general the musculature is flabby and weak, the heart weak and soft, the great blood vessels narrow and thin walled. The lymphoid nodules throughout the digestive tract are enlarged and prominent, the adenoid tissue in the throat and at the base of the tongue swollen, and the lymph glands in general larger than normal. Hypoplasia of the adrenals and the chromaffin system has been described.

The physiology of the thymus gland is obscure. That it bears some relationship to the genital system we know, in that it increases in size until puberty and then atrophies, in that castration causes persistent growth and retarded activity of the gland, and in that its removal hastens the development of the testicles. It is also believed that the thymus is concerned especially in the synthesis of nucleic acid[2].

These are textbook pictures and serve mainly to emphasize the inadequacy of our knowledge concerning the thymus gland and the lymphatic state. Boyd[3] has contributed one of the best of the later day studies of the subject, and she frankly disbelieves in the importance of the enlarged gland *per se* as a source of danger, and in the entity, status lymphaticus, as well. Much of the present confusion regarding the normal size of the gland she believes is caused by the failure to recognize the occurrence of age involution, beginning at puberty, and accidental involution, occurring in inanition, or in any condition which causes loss of weight. The size of the gland, consequently, depends largely on the state of nutrition, being greater in the well-nourished child.

Boyd finds, in her studies, a loss of thymus weight of from 5 to 8 grams in the first two weeks of life, from a mean birth weight of 13 grams. During this period, while the gland in the new-born is being compressed around and between the mediastinal structures, it is also losing weight. After the first two weeks of life it begins to increase in size, so that the portion around and between the blood vessels and trachea may conceivably cause pressure on vessels and nerves, particularly on the recurrent laryngeal. This supports the fact that most children do not develop thymic symptoms until from 4 to 6 weeks of age and have, along with inspiratory stridor, hoarseness and a crowing cry suggestive of spasm of the vocal cords from irritation of the recurrent laryngeal nerve.

The anatomic picture described as that of status thymico-lymphaticus, she believes, represents the normal thymus and lymphoid tissue of the well-nourished child, the growth curve of the thymus in the well-nourished child being of the same type as that of lymphoid tissue in general. A tabulation of many observations on thymic weights shows that the average weight at autopsy in well-nourished children is 13 grams at birth, 20 grams at 6 months and 35 grams at 13 years, and in poorly nourished children is 8

grams at 2 weeks, 6 grams at 6 months, and 13 grams at 13 years of age.

Wasson[4] also notes that, in a general way, undernourished infants have small thymuses while well-nourished and overweight children have moderate to large ones. He believes that many cases of so-called thymic stridor will show evidence of infection of the respiratory tract sufficient to cause the stridor.

The question of surgical risk, abetted by overzealous radiology, and the fact of an occasional unfortunate outcome to surgical anaesthesia has given rise to what Dr. John Lovett Morse has been pleased to call the "thymus obsession[5]." Rarely are subjective symptoms, objective signs, or clinical evidence used in making the diagnosis of an enlarged and morbid thymus gland, and the sole basis on which operation is delayed and the patient subjected to therapeutic radiation, is generally the diagnostic x-ray alone. There are no acceptable standards of normality or abnormality of the thymus gland by x-ray, because even at autopsy the gland by weight is subject to variations which permit only of average figures being made as partial guides to go by. If it is status lymphaticus which is feared, it is not an x-ray of the thymus gland which will give us information as to that; it must be a knowledge of the heart muscle, the blood vessels and the adrenals. In very many cases, in the wholesale x-raying of thymus glands, not even accepted standards of technique are being followed, for the phase of respiration will affect the size of the shadow, and the lateral view may show an enlargement which is not apparent in the antero-posterior position.

The roentgen ray, however, is the only available way by which anything approaching exactitude may be obtained in measuring the thymus gland in life, and regardless of its importance, many studies are being made by this method.

Pfahler[6], while he believes that the thymus may be enlarged without producing symptoms, and that symptoms may develop without an enlargement shown by x-ray, nevertheless believes that the roentgen ray is the most reliable means of diagnosis, and that radiation by x-ray or radium is specific in treatment. Perkins[7] believes that all children should be x-rayed before operation, on the basis that sudden death may result in patients with enlarged thymuses from primary anaesthesia or mild shock. He believes that the enlarged gland may be placed so low over the pericardium that it will not cast a characteristic shadow. King[8] assumes that cases showing pressure symptoms have antero-posterior enlargement producing pressure on adjacent structures, and that those showing large shadows with no symptoms have wide, flat thymuses.

Coe[9] finds that lymphadenitis of the upper mediastinum somewhat resembles an enlarged thymic shadow, although usually the shadow of lymphadenitis is concave laterally and is not widest above the heart. He has observed that the normal ratio of the supra-cardiac shadow to the internal transverse diameter of the chest at the angle of Louis is about 1 to 3 until about the sixth year. If this is found to approach or exceed 1 to 2, the thymus is enlarged. Mosher, MacMillan, and Motley[10], working at the Massachusetts Eye and Ear Infirmary, showed, in a series of 4820 x-rays, that 7 per cent. of children from 2 to 16 years have enlarged thymuses, their criterion being that in all suspicious cases the supracardiac shadow was at least 50 per cent. of the transverse diameter of the heart. They note a similarity between deaths from acidosis and those from status lymphaticus.

Despite the mass of accumulated x-ray data, however, we seem to be no farther on the way towards proving that the simple enlarged, or persistently large thymus gland is a menace to life, or indeed is a definite abnormality. Modern methods of study, nevertheless, are beginning to point towards a possible solution of the status lymphaticus puzzle, a solution which points away from a direct participation of the thymus gland and instead is tending to bring the adrenals into the limelight.

MacLean and Sullivan[11], noticing that the prostration of patients dying with the symptoms of status lymphaticus simulated sugar shock from overdosage of insulin and was out of proportion to the physical findings, have attacked the problem from the blood sugar angle. In three cases where the diagnosis of status lymphaticus was made by autopsy, blood taken within a half hour of death of patients in convulsions contained respectively 52, 57 and 48 milligrams per hundred c.c., the normal values being 80 to 120 milligrams. The blood sugar was found to be normal in other patients under similar conditions but dying of other diseases. The blood sugar taken from six patients while in convulsions due to other causes than status lymphaticus was found to be normal. Of blood sugars taken from six patients suspected of status lymphaticus with large thymuses by x-ray, but not in convulsions, one was slightly decreased, the others normal. Their findings suggest to the authors acute suprarenal insufficiency as the immediate cause of sudden death in this condition.

In order to add a little evidence to the accumulated data concerning the thymus gland and its potentialities for disaster the records of 1564 consecutive autopsies performed at the Massachusetts General Hospital from 1917 to 1928 have been examined. In those cases showing thymus glands in excess of the generally accepted normal weight for age, the clinical records have also been investigated. In these records particular attention has been paid to the state of nutrition, the presence or absence of general lymphoid hyperplasia, the adrenal glands, the great vessels, the history of previous operation, and x-rays of the chest. Only 44 of the 1564 cases had anatomical diagnoses of thymic enlargement or of status lymphaticus, and of these

Autopsy no.	Age	Sex	Nutrition	Anatomical Diagnosis	Previous Operation	Thymus wt. Gms.	Lymph Nodes Sm. intestine	Lymph Nodes L. intestine	Lymph Nodes Mes.	Lymph Nodes Br.	Adrenals	Great Vessels	X-ray
3825	20	F	Poor	Graves Disease Bronchopneumonia Hyp. & Dil. of heart	Day preceding death Thyroidectomy	90	+	+	+	+	neg.	small	-
3873	25	F	Good	Influenza Pneumonia Dilatation of heart	-	26	-	-	-	-	Large not sectioned	small	-
3916	11 mos.	M	Good	Hemorrhagic areas thymus & epicardium Hyp. & Dil. of heart Craniotabes. Fatty metamorphosis of liver	No history	30	+	+	+	+	neg.	neg.	-
4039	22 yrs.	F	Good	Subtotal Thyroidectomy	T. & A. 1 yr. ago	40	+	+	+	+	neg.	neg.	Prominence in region of pulmonary artery
4121	37 yrs.	M	Poor	Focal pneumonia Acute passive congestion. Hypertrophy of thyroid	Ligation thyroid Artery 5 mos. previously	27	+	+	+	+	neg.	neg.	neg.
4146	42 yrs.	M	Good	Pyopneumothorax Fibrinous pleurisy sl. arteriosclerosis	No history	45	-	-	-	-	neg.	neg.	-
4181	39 yrs.	F	Poor	Hypertrophied thyroid. Hyp. & Dil. heart. Chr. pass. congestion	-	33	-	-	-	-	neg.	neg.	Supracardiac dullness inc. in part due to hypertrophy of heart-may be due to enlarged thymus
4226	1 yr.	M	Good	Intussusception with operation	Operation previous day	35	+	-	+	-	neg.	neg.	-
4376	26 mos.	M	Good	Status lymphaticus	-	35	+	+	+	+	neg.	neg.	-
4406	1 yr.	M	Good	Bronchopneumonia Jacksonian Epilepsy Status lymphaticus		23	+	+	+	+	neg.	neg.	neg.
4431	3 days	-	Fair	Hemorrhagic disease of the New-Born	-	21	-	-	+	-	neg.	neg.	-
4440	2 mos.	M	Poor	Status lymphaticus Indigestion	-	30	+	+	-	-	neg.	neg.	-
4464	5 mos.	M	Good	Focal pneumonia Status lymphaticus	-	24	+	+	+	+	neg.	neg.	-
4549	14 mos.	M	Good	Otitis media Septicemia	-	22	+	+	+	-	neg.	neg.	-
4592	9 yrs.	M	Fair	Papilloma trachea Larynx Tracheotomy	Tracheotomy 1 yr. ago. Laryngoscopy under ether day before. Stopped breathing	45	+	+	+	+	neg.	neg.	-
4726	27 yrs.	F	Poor	Hypertrophied Thyroid Bronchopneumonia Hypertrophied heart Hemithyroidectomy	Hemithyroidectomy 3 days ago Appendectomy 3 yrs. ago	70	+	+	+	+	neg.	neg.	Increase in transverse diameter of heart. Increased prominence in region of left auricle
4759	7 mos.	F	Good	Laryngitis, tracheitis, bronchitis with oedema. Tracheotomy	Tracheotomy previous day	20	+	+	-	-	neg.	neg.	neg.
4825	38 yrs.	F	Good	Exophthalmic goitre Tertiary syphilis Parathyroid tetany	Subtotal thyroidectomy 8 days before death	35	-	-	-	-	neg.		Heart shadow slightly increased in size. Slight prominence ascending aorta. ? Slight widening low in mediastinum
4826	2 yrs.	M	Fair	Megacolon-Intestinal obstruction	Died at operation Sigmoidostomy	40	+	+	+	+	small	neg.	-
4828	1 yr.	M	Good	Tracheotomy, Oedema of lungs. Laryngeal & subglottic oedema	Tracheotomy under local anaesthesia 2 mos. ago	29	+	+	+	+	neg.	neg.	Slight prominence pulmonary conus
4863	2 yrs.	M	Good	Harelip & cleft palate. Status lymphaticus	Repair of harelip 2 yrs. ago. Repair of cleft palate 12 hours before death	50	+ large	+ tonsils & adenoids	+	-	neg.	neg.	-
5025	11 mos.	M	Good	Diarrhea. Dehydration. Acidosis	-	26	+	+	+	-	neg.	neg.	-
5119	26 yrs.	F	Good	Parathyroid deficiency. Hypothyroidism. Subtotal Thyroidectomy. Tracheotomy	Thyroidectomy 10 yrs. before death	21	-	-	-	-	neg.	neg.	neg.

44 cases, 21 were excluded because their thymus weights were within the limits of normality as now considered. In 23 cases only did the diagnosis of thymic enlargement seem justified.

Nine cases were of adults, all but one of whom were thyroid cases. Case 4146, a man of 42 years with a 45 gram thymus, died of pyopneumothorax with fibrinous pleurisy.

Five cases were poorly nourished, although four of these showed some degree of lymphoid hyperplasia, as denoted by the plus (+) sign.

Only five cases of the total number showed no lymphoid hyperplasia as denoted by the minus (—) sign.

Eleven, or nearly half the cases, had had major operations from one day to several years preceding death.

Only one, case 4826, died during operation—a sigmoidostomy for intestinal obstruction.

In two cases the great vessels were characterized as "small." In one case the adrenal glands were characterized as "large," and in one case as "small." They were, however, not examined histologically in most of the cases, and where microscopical examination was made, they were considered to be normal.

Nine cases had had chest x-rays. One showed prominence in the region of the pulmonary artery (Case 4039); one showed increase of supracardiac dulness in part due to hypertrophy of the heart, but possibly due to enlarged thymus (Case 4181); one showed increase in the transverse diameter of the heart with increased prominence in the region of the left auricle (Case 4726); one showed a heart shadow slightly increased in size with slight prominence of the ascending aorta and a questionable slight widening low in the mediastinum (Case 4825); and one showed slight prominence of the pulmonary conus. The other four were entirely negative.

Case 4376, a boy of 26 months with negative autopsy findings except for a 35 gram thymus and lymphoid hyperplasia, had died within twenty-four hours of the onset of an acute gastro-intestinal disturbance with fever. He had a past history of tonsillar infection.

Case 4406, a boy of one year of age with a 23 gram thymus, died in convulsions, which he had been subject to since birth. He also had bronchopneumonia.

Case 4440, a boy of 2 months with negative autopsy findings except for a 30 gram thymus and lymphoid hyperplasia, had died within twenty-four hours of the onset of an acute gastro-intestinal disturbance with fever.

Case 4464, a boy of 5 months with a 24 gram thymus, lymphoid hyperplasia and focal pneumonia, died seven days after the onset of an acute infection ushered in with convulsions, fever and vomiting.

It is conceivable that any of these four cases might have died as a result partly of status lymphaticus, although in none of them is it necessary to conjure up a diagnosis of status lymphaticus to account for death.

It is interesting, to say the least, in these days of thymic popularity, that of 1564 routine autopsies of all ages, only 23 showed thymuses above the normal weight for age, and that of these 23, 9 were in adults, 8 with hyperthyroidism and one with a severe and chronic infection. It is difficult to avoid the conclusion that the importance, as well as the frequency, of thymic enlargement must be greatly exaggerated.

SUMMARY

Of 1564 routine autopsies at the Massachusetts General Hospital 23 showed enlarged thymuses.

Eleven cases had survived the immediate effects of major operations.

One case only died during operation—a sigmoidostomy for intestinal obstruction.

Nine cases had had chest x-rays, in only one of which was possible thymic enlargement suggested.

Four cases might possibly have died as a result of status lymphaticus, although in none of them was such a diagnosis necessary to account for death.

The present vogue of x-raying for thymus and radiating all cases in which a shadow appears would seem to be unjustified.

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BRONCHOSCOPY IN ACUTE LUNG ABSCESS

Report of Four Cases*

BY LEIGHTON F. JOHNSON, M.D., F.A.C.S.†

THE bronchoscope is directly responsible for rekindled interest in lower respiratory infections, not only by the bronchoscopist, but by the internist, roentgenologist, and thoracic surgeon. Direct visibility upon the pathological process, the securing of uncontaminated cultures, bronchial aspiration, and topical medication to the bronchial mucosa have been elaborated upon so ably and are so obviously expedient as to need no further comment.

To approach an accurate evaluation of bronchoscopy in the treatment of lung abscess, it is the duty of the various bronchoscopic clinics to report their successes and failures. Prompted by this responsibility, I shall report four cases treated during the past year.

The selection of suitable cases of lung abscess for bronchoscopic treatment presents a problem requiring much study, and the solution is adequately reached only through collaboration with the roentgenologist, internist, and surgeon.

It appears to be quite generally agreed that the first therapeutic consideration in lung abscess without pleural involvement, whether centrally or peripherally located, should be bronchoscopy. Any lung abscess with pleural involvement or empyema is distinctly a problem for external surgery. The secret of success in the treatment of these cases is the early diagnosis and early bronchoscopic treatment. In the instance of abscesses located peripherally in the lung, if definite signs of improvement are not apparent after a reasonable number of bronchoscopies, external surgery is indicated.

There is nothing that I know of in medicine more dramatic or fascinating to observe than the change which takes place following bronchoscopy in acute lung abscess. To study a patient profoundly toxic, with a temperature range from 102-4, with nausea and vomiting, an incessant cough, with an indescribably offensive breath, and then possibly twenty-four hours later to observe a relatively normal temperature, an absence of odor of the breath, a cessation of the gastric disturbance and an interest in the hospital menu, certainly warrants the inevitable conclusion that here, truly, is a life-saving procedure.

Just what step, or steps, in bronchoscopy are really responsible for the benefits derived is still a matter of conjecture. It hardly seems reasonable to believe that bronchial aspiration alone may effect this end, when one considers that a patient may cough up after bronchoscopy more pus than is aspirated at the time of bronchoscopy. Nor does it appear reasonable that topical applications to the inflamed bronchial mucosa can produce so drastic a change. It does, however, seem possible that the mere passing of the bronchoscope may dilate the dependent bronchus or bronchi and thus more adequately drain the infected area in the same way that dilatation of a ureter is helpful in the treatment of pyelitis.

At our clinic, the injection of lipiodol has been disappointing in ascertaining the localization and the delineation of lung abscess. We have injected the warmed oil through the bronchoscope into the cocainized portion of the bronchial tree under suspicion, and in no case has it added materially to the information already received by medical and x-ray examination.

No general anesthesia has been used in this clinic in the treatment of lung abscesses. The patient is moderately narcotized with morphine and scopolamine and the superior laryngeal nerves are cocainized in either pyriform sinus. The discomfort from bronchoscopy with this anesthesia and gentle manipulation is not remarkable.

CASE I. Male. Age 36. Four days following an operation for gastro-enterostomy, the patient came down with a high temperature, chill, pain in the left chest, and an incessant, unproductive cough. The chest consultant and roentgenologist reported the presence of a lung abscess in the lower left lobe. At bronchoscopy, nothing was seen in the left main bronchus except a marked reddening and thickening of the mucosa. The opening of the bronchus to the lower lobe was shrunken by the application of cocaine and adrenalin. Pus was seen to come from this area. The patient improved after each bronchoscopy, and since the sixth one has been free from all symptoms.

CASE 2. Male. Age 21. Six days following a tonsillectomy the patient became acutely ill. The temperature rose to 105, with pain in the left chest, an incessant cough, and offensive sputum. A medical consultant was summoned. A diagnosis of an acute lung abscess of the left lower lobe was made and supported by the radiograph. Two days later, in spite of a temperature of 104 and profound toxaemia, a bronchoscopy was done. The temperature returned to normal within twenty-four hours and the sputum was odorless. The patient was bronchoscoped again six days later. The temperature remained normal. He was discharged from the hospital two weeks later, and is now at work and free from all symptoms. (Tonsillectomy was performed in the recumbent position).

CASE 3. Female. Age 16. A diagnosis was made of acute lung abscess of the lower left lobe following

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a bronchopulmonary infection. Had been treated medically for two weeks before being referred to the Bronchoscopic Clinic. The patient was bronchoscoped three times, all symptoms disappeared, she was discharged from the hospital, and has been perfectly well since.

CASE 4. Female. Age 21. Five days following a tonsillectomy in the upright position, the patient became critically ill. An internist was called in consultation, an x-ray was taken, a diagnosis of lung abscess made, and the patient was treated at home medically for three weeks. During this time the patient became markedly worse, her temperature ranging from 102-4. When first seen by me, she appeared desperately ill. She had a constant severe headache, nausea and vomiting, in addition to her chest symptoms. She was moved to the hospital and examined by a neurologist and ophthalmologist to determine the presence or absence of a metastasized brain abscess. Their report being negative, she was bronchoscoped. Her temperature reached normal and remained there following her first bronchoscopy. The headache, nausea, and vomiting disappeared within twenty-four hours, and the cough markedly lessened. Four days later, another bronchoscopy was performed. She left the hospital ten days after admission, and has been perfectly well ever since.

To the sceptic, we cannot deny the possibility of a spontaneous recovery in these cases. We can say, however, we have had four, and only four acute lung abscesses, all of which were bronchoscoped and are well.

THE VALUE OF A MEDICAL LIBRARY*

BY JAMES F. BALLARD†

IT seems unnatural, if not unnecessary, for me to have to talk to you on the value of a medical library to the physician and to the community, for it should be apparent that the medical library is an essential part of the educational feature of any community. A good medical library can help to elevate the standard of the medical profession, to improve medical practice, to enrich the teaching of medical students and nurses, to promote research and discovery, and through all these contribute to the health and hygiene of the community as a whole.

The physician must keep up with the constantly changing methods of diagnosis and treatment. He cannot buy for himself all the new books or take all the new periodicals which contain the latest facts and opinions bearing upon important branches of medicine. Books themselves cease to be up-to-date before they are printed.

The Library is the post-graduate school for the practising physician. In its periodicals and monographs he finds the latest knowledge of the healing art and thus may keep abreast of the times to the benefit of himself and his patients. It has been said that research begins in the library and not in the laboratory; at any rate, it must be admitted that the research worker, in order to save time and needless labor, should know what has gone before and only by consulting the records of experience and of experiment contained in the literature in the medical library may he so inform himself.

To the research worker, be he clinician, laboratory investigator or biologist, a good library is a necessity. He must inform himself of previous work in his field before beginning on his own experiments. An idea, supposedly new, may be found to be as old as medicine itself. Then, the seeker after knowledge gains new inspiration and encouragement in the reading of the writings of the great thinkers and investigators in his particular sphere.

The medical student should be encouraged early in the curriculum to make use of the library. This is not a new idea; in 1812 Dr. Robert Watt urged his students to consult the original sources, to examine the facts and opinions and to draw their own conclusions. In bibliographic work, as in clinical work, it is of the utmost importance that the student should learn how to make inquiries for himself. According to Dr. Barker of Baltimore, the "Education of a student in the use of medical literature is far more important than supplying him with large amounts of information derived from that literature."

The cultural side of medicine must not be forgotten and scholarly physicians interested in medical history, biography and bibliography should be encouraged to the best of our abilities. Such men are an asset to the profession and the community.

Eminent physicians of international reputation have been greatly impressed with the value of the medical library to the learned professions and the public. Permit me to quote to you from the classical addresses of the departed Oliver Wendell Holmes, Sir William Osler and David W. Cheever, the living George E. Vincent, President of the Rockefeller Foundation, and our own Harvey Cushing.

Dr. Holmes, in his address at the dedication of the Boston Medical Library in 1878[1], with his ready wit characterized the literature of the day in these words: "It is with the live literature of his profession that the medical practitioner is first of all concerned. The first printed books—the incunabula—were enclosed in boards of solid oak, with brazen clasps and corners; the boards by and by were replaced by pasteboard covered with calf or sheepskin; then

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†For record and address of author see "This Week's Issue," page 94.

cloth came in and took the place of leather; then the pasteboard was covered with paper instead of cloth; and at this day the quarterly, the monthly, the weekly periodical in its flimsy unsupported dress of paper, and the daily journal, naked as it came from the womb of the press, hold the larger part of the fresh reading we live upon. We must have the latest thought in its latest expression; the page must be newly turned like the morning bannock; the pamphlet must be newly opened like the ante-prandial oyster. Thus a library, to meet the need of our time, must take, and must spread out in a convenient form, a great array of periodicals. Our active practitioners read these by preference over almost everything else. Our specialists, more particularly, depend on the month's product, on the yearly crop of new facts, new suggestions, new contrivances, as much as the farmer on the annual yield of his acres. One of the first wants, then, of the profession is supplied by our library in its great array of periodicals from many lands in many languages. Such a number of medical periodicals no private library would have room for, no private person would pay for, or flood his library with if they were sent him for nothing.

"A great portion of the best writing and reading—literary, scientific, professional, miscellaneous—comes to us now, at stated intervals, in paper covers. The writer appears, as it were, in his shirt-sleeves. As soon as he has delivered his message the book-binder puts a coat on his back, and he joins the forlorn brotherhood of 'back volumes,' than which, so long as they are unindexed, nothing can be more exasperating. Who wants a lock without a key, a ship without a rudder, a binnacle without a compass, a check without a signature, a greenback without a goldback behind it?

"Our American atmosphere is vocal with the flippant loquacity of half knowledge. We must accept whatever good can be got out of it, and keep it under as we do sorrel and mullein and witchgrass, by enriching the soil, and sowing good seed in plenty by good teaching and good books, rather than by wasting our time in talking against it. Half knowledge dreads nothing but whole knowledge.

"I have spoken of the importance and the predominance of periodical literature, and have attempted to do justice to its value. But the almost exclusive reading of it is not without its dangers. The journals contain much that is crude and unsound; the presumption, it might be maintained, is against their novelties, unless they come from observers of established credit. Yet I have known a practitioner—perhaps more than one—who was as much under the dominant influence of the last article he had read in his favorite medical journal as a milliner under the sway of the last fashion-plate. The difference between green and seasoned knowledge is very great, and such practitioners never hold long enough to any of their knowledge to have it get seasoned.

"The public will catch the rays reflected from the same source of light, and it needs instruction on the great subjects of health and disease,—needs it sadly. It is preyed upon by every kind of imposition almost without hindrance. Its ignorance and prejudices react upon the profession to the great injury of both. The jealous feeling, for instance, with regard to such provisions for the study of anatomy as are sanctioned by the laws in this State and carried out with strict regard to those laws, threatens the welfare, if not the existence of institutions for medical instruction wherever it is not held in check by enlightened intelligence.

"Thus, then, our library is a temple as truly as the dome-crowned cathedral hallowed by the breath of prayer and praise, where the dead repose and the living worship. May it, with all its treasures, be consecrated like that to the glory of God, through the contributions it shall make to the advancement of sound knowledge, to the relief of human suffering, to the promotion of harmonious relations between the members of the two noble professions which deal with the diseases of the soul and with those of the body, and to the common cause in which all good men are working, the furtherance of the well-being of their fellow creatures!"

In 1901, at the dedication of the third home of the Boston Medical Library, Sir William Osler delivered the famous address which he later named "Books and Men"[2], in which he related the story of how he travelled to Boston from Montreal to consult the books in the Boston Medical Library because he could find no references in the McGill library to the subjects he was investigating.

"It is hard for me to speak of the value of libraries in terms which would not seem exaggerated. Books have been my delight these thirty years, and from them I have received incalculable benefits. To study the phenomena of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all. For the teacher and the worker a great library such as this is indispensable. They must know the world's best work and know it at once. They mint and make current coin the ore so widely scattered in journals, transactions and monographs. There should be in connection with every library a corps of instructors in the art of reading, who would, as a labor of love, teach the young idea how to read. An old writer says that there are four sorts of readers: 'Sponges which attract all without distinguishing: Howre-glasses which receive and powre out as fast; Bagges which only retain the dregges of the spices and let the wine escape, and sives which retaine the best onely.'

A man wastes a great many years before he reaches the 'sive' stage.

"For the general practitioner a well-used library is one of the few correctives of the premature senility which is so apt to overtake him. Self-centered, self-taught, he leads a solitary life, and unless his every-day experience is controlled by careful reading or by the attrition of a medical society, it soon ceases to be of the slightest value and becomes a mere accretion of isolated facts, without correlation. It is astonishing with how little reading a doctor can practise medicine, but it is not astonishing how badly he may do it. Not three months ago a physician living within an hour's ride of the Surgeon-General's Library brought his little girl, aged twelve, to me. The diagnosis of infantile myxedema required only half a glance. In placid contentment he had been practising twenty years in 'Sleepy Hollow' and not even when his own flesh and blood was touched did he rouse from an apathy deep as Rip Van Winkle's sleep. In reply to questions: No, he had never seen anything in the journals about the thyroid gland; he had seen no pictures of cretinism or myxedema; in fact his mind was a blank on the whole subject. He had not been a reader, he said, but he was a practical man with very little time. I could not help thinking of John Bunyan's remarks on the elements of success in the practice of medicine. 'Physicians,' he says, 'get neither name nor fame by the pricking of wheals or the picking out thistles, or by laying of plaisters to the scratch of a pin; every old woman can do this. But if they would have a name and a fame, if they will have it quickly, they must do some great and desperate cures. Let them fetch one to life that was dead, let them recover one to his wits that was mad, let them make one that was born blind to see, or let them give ripe wits to a fool—these are notable cures, and he that can do thus, if he doth thus first, he shall have the name and fame he deserves; he may lie abed till noon.' Had my doctor friend been a reader he might have done a great and notable cure and even have given ripe wits to a fool! It is in utilizing the fresh knowledge of the journals that the young physician may attain quickly to the name and fame he desires."

At this same meeting, in 1901, David Williams Cheever, beloved President of the Library, summed up in a few words the great importance of a medical library to the profession and community:

"A medical library is peculiar in that it must also be a contemporary and a periodical library. The present is even more valuable to it than the past, although the records of the past are inestimable. It has been well said that the burning of the library of Alexandria set civilization back through all the centuries of the Middle Ages. So, were all records of medicine blotted out, the next generation of doctors would begin as children over again. What has been discovered has been recorded, and were that lost, humanity would be reduced to the rough medical practice of the savage. It is impossible to set a money value on medical science, and without the records of science, there would be no medical art. Were anatomy, physiology and pathology lost, we should be groping in the first footsteps of ignorance. Were the history of all diseases, recorded in our books, destroyed, we should be only children as observers. But to the younger doctors who listen to me it will appear that the present is all important. And if we were suddenly deprived of the knowledge acquired in the last fifty, twenty, or even ten years, what a change would come over medicine! Anesthesia, antisepsis and bacteriology are now the paramount factors of all our progress. And the peculiarity of this species of knowledge is that it is ephemeral; it lives but a day; it is not lost, but its seeds germinate in new discoveries the next day. What we know today may be obsolete tomorrow, simply because it is subject to daily investigation and daily modification.

"This form of knowledge requires an ephemeral literature to record it. The monthly, the weekly periodicals supply this knowledge. Hence the importance of a periodical library in medicine."

Dr. Vincent, at the 50th anniversary of the Boston Medical Library in 1926, spoke of the library as being part of the "social memory."[3]

"It is to these workers that society looks for the efficient service of the collective memory. The classification, the catalogue, and the index make discovery and selection feasible. These devices transform a collection of books into a modern, organized library, just as systematic training and methodic habits give efficiency to the individual mind. Indeed, the well-ordered library with its easily accessible information becomes an extension of the educated memory, a tool, a labor-saving device, which relieves the individual of the burden of memorizing material upon which he knows he can always lay his hand. Thus time and energy are released for more useful and constructive mental effort.

"A medical group which works with little or no reference to books and journals suffers serious limitations. Without knowledge of what others have discovered, daily experience cannot be resourcefully interpreted. Avoidable mistakes, waste, and duplication of effort are inevitable. Doctors become victims of empiricism and routine; imagination and initiative lack stimulus; enthusiasm and energy decline; minds grow sterile that under the quickening influence of the recorded experience of others might have been fruitful. Dr. Abraham Jacobi devoted a fascinating article to showing how close to modern discoveries men of earlier times really came. If careful heed had been given their writings,

many results might have been hastened by ten, fifty, or a hundred years. The new is sometimes only the old rediscovered. Nor is hastening the pace of medical progress the only gain from consulting the historical literature. Familiarity with the past has another advantage. It induces a becoming and amiable modesty in medical men of the present.

"The old safety deposit type of library with the vigilant guardians who eyed every visitor suspiciously and hated to see a book taken away has long since passed. But too many libraries are still of the quiescent sort. 'Here are the books; there is the catalogue; if you find anything you want let us know and we'll give it to you.' The aggressive modern library, especially that of the professional group, is animated by a wholly different spirit. It takes the initiative in preparing current bibliography, in pressing upon its members the things they ought to know about. Many industrial concerns, for example, have established libraries in their plants and offices. Books and journals with references marked for the attention of specified individuals are circulated systematically for reading and checking. The Boston Medical Library has already established a reputation as an initiating memory for its group. True to its motto, it guards and teaches. It will doubtless, by bibliographical bulletins, mailing lists, special reference services and the like, extend and elaborate its activities to keep the profession informed and stimulated.

"The highest type of professional comradeship and loyalty can be fostered only by the vivid and warm memory of the group in its historical development and by an imaginative idea of its aims for the future. So also with its professional work. An historical knowledge of a disease gives a valuable mental perspective. The history of medicine both for its professional and cultural values should play an important rôle in the early training of the doctor and should be cultivated throughout his professional career. Moreover an intelligent appreciation of the great personalities of medical history stirs the imagination and strengthens the resolution to emulate their virtues and to pass on to worthy successors an enriched tradition of knowledge, skill and devotion. In the absence of such memories no group can achieve character and personality.

"Without this splendid institution or another very like it, how different the medical profession of greater Boston and New England would be! In this beautiful building is housed one of the important medical libraries of the world, efficiently organized, alertly administered, growing year by year in size and usefulness. To these rooms come physicians to seek the knowledge and wisdom of the social memory for the healing of the sick and the prevention of disease, for personal growth, for the progress of medicine. Here gather groups for conference and discussion. Here are heard leaders in laboratory and clinic who report upon the current developments in medical sciences and arts. Here are found portraits of men who have played a loyal part in building up a noble profession and live on in the tradition which gives meaning and inspiration to this place."

Harvey Cushing[4], in his address at the opening of the new building of the Cleveland Medical Library Association in 1926, aptly states that "the soul of an institution that has any pretense to learning comes to reside in its library, no less than does the soul of a profession or of an individual. He then goes on to say:

"The profession cannot long play the cuckoo with its books. It must build its own nest, and care for its own brood. A book-conscience, thereby developed, serves as the best possible measure of the status of the profession. As the calorimeter tells the activity of the patient's metabolism, so you may determine the plus or minus activity of the local profession in any district by the condition of its library. And no less well may one gauge the quality of a medical school, of a hospital, of a laboratory, of the individual doctor himself, by the same standard.

"For the first evidence of solidarity among our fellowkind, wherever they are found, is the establishment of a library for use in common and from which, as an appropriate and convenient centre, there comes to radiate in due time a host of subsidiary activities.

"The doctors' books are of a different sort from the lawyers' and the preachers'. They in their professions depend as yet largely upon authority. The doctor, ever since Galen was toppled from his dominating seat, has been skeptical of authority and perhaps too much inclined to novelty. But if he makes any pretense of 'keeping up' with the amazing, prodigious and often revolutionizing advances which, through some new discovery, occur almost overnight, he must read, or attend meetings—or better, both.

"Mere numbers of books, to be sure, is no measure of the usefulness and value of a professional library. Its real value depends on the completeness of its journal files and important source-books, not on text-books of ephemeral interest."

Dr. Cushing, in the concluding paragraphs of his address, sums up the value of a library in these few words: "Books are the most important tools of our craft when assembled in mass in our great medical libraries."

The general public has no conception of the value and significance of the medical library. Many of the laity do not seem to realize that medicine is a constantly changing science undergoing a daily metamorphosis, and requiring a daily literature to keep up-to-date with its

newer developments. It is upon its doctors that the people have to rely for the facts and methods, that, when applied, prevent disease, promote health, produce cures and mitigate suffering.

Preventive medicine is the great objective of the present generation and a great literature has grown up in this particular field. The medical library must collect the literature of public health and make it available not only to the medical profession but to public health workers, social workers and the laity. Authoritative literature on child hygiene, pre-natal care, pure milk, clean food, proper diet, school hygiene, dental clinics, health education, personal hygiene, popular medicine, sex relations, hygiene of the common infections, and like subjects must be provided for in some library in the community. Every community should have a medical library suited to its needs, preferably an up-to-date working collection of periodicals, late texts, reference works and bibliographical aids, and have access to a large, complete reference collection.

I look forward to the time when all the medical libraries of the country will be welded into a system which will serve without undue duplication and at a minimum of expense. I see the country divided into large sections, each provided with a large reference library, which shall keep everything written or printed on medicine and the allied sciences, and make all of its material easily available to the smaller libraries in its particular region. In each state there will be a smaller library to which shall be subordinated the working collections of the hospitals, medical schools, public health departments, etc. These will be all co-ördinated into a smoothly working bibliographical machine which will function efficiently at the lowest possible cost compatible with good service. The Director of the regional reference library should have some supervision over the libraries in his region. Such co-öperation will do away with much needless duplication of expensive material and make possible bibliographical work which has hitherto been attempted only on a small scale.

The Boston Medical Library was first discussed on December 21, 1874. In four years from that time it had acquired a home, and a second one, and 10,000 volumes. In 1901 the volumes had increased to 33,000 and there were 30,000 pamphlets. Today the volumes are 150,000, the pamphlets 100,000 catalogued and thousands uncatalogued. When it moved into its present home, in 1900, a definite policy was formulated which has been maintained consistently to the present time. This policy, briefly stated, is: "That the Boston Medical Library shall be the Central Medical Reference Library for the New England states." In furtherance of this policy the Library co-öperates, to the best of its ability, with other libraries and institutions throughout New England. It lends on inter-library loan to any library, medical or general, in New England, thus making its resources available to all doctors in its territory. It freely enters into any nation-wide plan having to do with medical libraries or medical bibliography. The Boston Medical Library classification scheme for medicine is widely known and has been adopted by the Medical Library Association of America as the standard for medical libraries. It is in use in many libraries in this country and abroad.

This spirit of co-öperation is well shown in its work on the National Union List of Serials. Despite the fact that the Library was short of help, it gave much time during two years to the checking of the list and expended every dollar it could spare to the completing of essential sets before the final edition went to press. The Library has, as far as funds permitted, kept up-to-date with current medical progress and has purchased periodicals and serials on Tropical Medicine and Public Health and in unusual languages as opportunity offered. The Library is also represented in the check lists of the American Chemical Society and the National Research Council. It never neglects an opportunity for co-öperation in its field. Its Charter is so broad that it covers the whole field of medical activity in the widest sense of the word.

The Library is desirous of establishing branches or co-öperating with existing small libraries throughout Massachusetts and gradually throughout New England. It will send at any time, to any library or community, an expert to survey and advise concerning existing collections or new projects. It is desirous of doing what it can to further the development of suitable medical library facilities in its territory. It is about to embark on a campaign to raise funds for a new stack building and for endowment purposes. In connection with this new endowment, it desires to establish a new bibliographic service for its members and the medical public, publish a bulletin at regular intervals, a monthly book-list of all new books, the index to the Boston Medical Library Classification and list of subject headings, also a number of special bibliographies, maintain a central book-buying service whereby co-öperative buying can be carried out for all medical institutions of Boston as well as members of the Library, establish branch libraries, provide a messenger and delivery service and arrange for a series of practical lectures.

There should be no reason why this service should not be extended to such communities as yours, when, as, and if established. The large library should be strongly rooted in its community through the medium of its branches and affiliations.

Definite standard requirements cannot be formulated for the small library as much de-

pends on such varying conditions as environment, local resources, type of library, available funds, etc. One of the important essentials not usually considered is the establishment of proper methods of work. Then, in order of importance, come bibliographic aids and reference works, periodicals, monographs and text-books. The collection should be kept up to date. Add and discard without regard to the size of your collection: do not keep a book because it is a volume to be added to the count, but strive for quality not quantity.

Big things grow out of small beginnings: witness the founding of the great Yale Library where "each member brought a number of books and presented them to the body; and, laying them on the table, said these words, or to this effect: "I give these books for the founding of a College in this Colony."

Manchester, with its population of eighty-five thousand people, its one hundred physicians, five hospitals and a live medical society is the natural medical center of the state of New Hampshire and the local medical profession should take advantage of the opportunity offered for constructive service to the profession and the community. The city has a fine library, well administered, with a medical room which, for the present at least, can serve as the home for the reference medical library for the city and state. The Carpenter Memorial Library is greatly in need of additional stack space to house properly its increasing collections and to carry on its work. When this stack space is procured, it will be of great advantage to the medical library as it will provide the needed room for expansion of the medical collection, which should soon outgrow the book space in the medical room. The physicians of the city should do all they can to bring about the early erection of a new stack floor in their fine library, which is a credit and asset to the community.

The success of a library is dependent upon three primary factors; space to house its books, a competent and well trained library staff to care for and make available the books, and sufficient funds to keep the collections up-to-date.

The Carpenter Memorial Library is a fine, well constructed building, which, as soon as the needed stack floor can be constructed, will provide space for the medical collection which it is hoped will be established in the near future. The Library is well-administered under the direction of your competent librarian, Miss Winchell. Your one great need is money to build up a medical reference collection and keep it up-to-date.

My recommendation is that a central medical reference collection be established at the City Library; that small subordinate collections be placed in all of the hospitals; that your Society take steps to procure the funds needed for capital outlay and endowment purposes. I will submit a report to your Library Committee outlining the plans for the establishment of the system with estimates of costs and lists of desirable books and periodicals. The Boston Medical Library will be glad to advise you and to help you to the best of its ability.

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THE HEALTH PLAYWRITING CONTEST

The fifth Health Playwriting Contest in Massachusetts has been announced for 1929 by the Massachusetts Tuberculosis League.

In the years 1925-1928 the Contest was held under the auspices of the National Tuberculosis Association. The National Organization feeling that it had demonstrated the value of the Contest announced the discontinuance of the competition on a nation-wide basis and recommended that it be conducted in the future on state lines. The New England Tuberculosis Conference which comprises the tuberculosis associations of the six New England States in view of the increasing solidarity of the New England States decided to run the 1929 Contest on an interstate basis.

Prizes for the plays selected will be as follows:

First prize	$100
Second prize	50
Third prize	25

The judges of the Contest will be: E. E. Clive, Managing Director of the Copley Theatre, Boston, Massachusetts, Dr. Marion Gleason, Director, Child Welfare Division, Rhode Island State Board of Health, Providence, Rhode Island, and James N. Pringle, Deputy Commissioner of Education of the State of New Hampshire, Concord, New Hampshire.

Further information about the Contest may be secured from Frank Kiernan, Executive Secretary, Massachusetts Tuberculosis League, 1149 Little Building, Boston, Massachusetts, or Mrs. Theresa R. Anderson, R. N., Staff Supervising Nurse, Maine Public Health Association, State Trust Building, Augusta, Maine; Dr. Robert B. Kerr, Executive Secretary, New Hampshire Tuberculosis Association, City Mission Building, Manchester, New Hampshire; Harold Slocum, Executive Secretary, Vermont Tuberculosis Association, 209 College Street, Burlington, Vermont; Willis E. Chandler, Executive Secretary, Rhode Island Tuberculosis Association, 139 Mathewson Street, Providence, Rhode Island; Miss Mabel Baird, Field Secretary, Connecticut State Tuberculosis Commission, State Capitol, Hartford, Connecticut.

MEDICAL PROGRESS

CARDIOVASCULAR REVIEW*

Review of the Literature on Cardiovascular Disease for the Year 1927

BY ROBERT S. PALMER, M.D.,† AND HOWARD B. SPRAGUE, M.D.†

1. Introduction.
2. Physiology.
3. Etiology and Types of Heart Disease.
   a. General.
   b. Angina pectoris.
   c. Congenital heart disease.
   d. Coronary circulation and disease.
   e. Diphtheritic heart disease.
   f. Endocarditis. Acute bacterial, subacute bacterial, rheumatic.
   g. Syphilitic heart disease.
   h. Thyroid heart disease.
   i. Ayerza's disease and miscellaneous types.
   j. The heart in pregnancy.
   k. Heart block.
4. Pathology.
5. Physical Signs.
   a. General.
   b. Disturbances of cardiac rhythm.
   c. Gallop rhythm.
6. Blood Pressure.
7. Vasomotor Disease and the Capillaries.
8. Symptoms.
9. Electrocardiography.
10. X-ray.
11. Pharmacology.
12. Treatment—Medical and Surgical.
13. Social and Economic Aspects of Heart Disease.
14. Miscellaneous.

1—Introduction

THE literature on cardiovascular disease for 1927 has been reviewed with the purpose of presenting the main features in abstract form. The various headings will be taken up alphabetically and references will follow each section.

One of the great losses to scientific medicine and to cardiology was the death of William Einthoven. Einthoven was trained at Utrecht and was appointed at the age of 25 to the chair of physiology at Leyden which place he held until his sixty-seventh year. He was especially prepared in physics and set himself to developing recording instruments. This finally led to the Einthoven string galvanometer after over twenty years of work. He published papers indicating the use of this instrument in heart disease in 1906 and 1908. He was the first to develop the three leads and to estimate the resultant electrical axis from them.

He used his instrument in the study of other physiological phenomena as nerve conduction and the recording of heart sounds.

The culmination of years of renown and honors was the awarding of the Nobel prize for medicine in 1924.

Personally he was a charming, simple modest man of "natural and profound courtesy". He was "unswerving in his devotion to truth".

He was born in 1860 at Samarang (Java) where his father was a practitioner. After graduating from Utrecht he became a medical student in 1878 and after his course he became assistant to Snelling and to Donders in physiology. He died September 29, 1927.

William Einthoven, M.D., Ph.D.: Obituary. Lewis, T., Brit. Med. Jour., 3483:664, Oct. 8, 1927.

2—Physiology

Clark in a very interesting book on comparative physiology teaches us something "of the simple tubular hearts of the lower invertebrates along which infrequent peristaltic waves slowly pass, and of the four-chambered heart of the canary, which contracts" 1,000 times a minute. He contrasts the physiology of the athletic and non-athletic animals as the hare and the rabbit.

Andrus and Carter concluded from research upon the mechanism of action of hydrogen ion upon cardiac rhythm that "the cardiac tissue is peculiarly sensitive to alterations in hydrogen ion concentration, whether this occurs in the cell itself through products of its own metabolism or by alterations in the pH or in CO_2 content of the fluid bathing it, and suggest that the difference in hydrogen ion concentration within and without the cell is the factor controlling its excitation."

Bjerlow and Liljestrand studied the resting minute volume of the heart in man during recurrent fever and found that oxygen utilization remained constant at normal and elevated temperatures thus there must have been a rise in minute volume of the heart in direct proportion to increased oxygen consumption. The output per beat remained unaltered or even diminished.

Blalock and Harrison found that progressive hemorrhage in dogs does not cause a change in cardiac output until shock is approached when the cardiac output rapidly decreases. Diminution of the hemoglobin content of the blood is associated with an increased cardiac output. The more rapidly a given degree of anemia is produced, the more is the output of the heart increased. Capillary oxygen pressure may be an important factor in the regulation of the output of the heart.

*From the Cardiac Clinic of the Massachusetts General Hospital.

†For record and address of author see "This Week's Issue," page 94.

Blumgart and Yens described a method of estimating the velocity of blood flow in man by injecting an active deposit of radium in non toxic amounts in one arm and noting the time of its arrival in the other arm by a modified C. T. R. Wilson cloud chamber device.

Blumgart and Weiss then published a series of important papers giving the results of observations made using this method of estimating quantitatively a fundamental aspect of the circulation in normal and diseased subjects. They found the average arm to arm circulation time in normal people was 18 seconds, varying from 14 to 24 seconds. The flow was somewhat more rapid in children. Blood pressure in normal variation did not change the velocity. Increased pulse rate might increase velocity. Fourteen patients with rheumatic heart disease and seven with luetic heart disease showed no reduction in velocity save in the presence of congestive failure and the degree of slowing was in proportion to the degree of failure. Valvular disease alone did not reduce velocity of flow. After acute rheumatic fever, rapid heart with slightly increased velocity tended to occur. The authors found reduction of velocity in patients with arteriosclerosis and myocardial damage proportional to the loss of reserve. This occurred in those with normal rhythm and auricular fibrillation caused additional retardation. In arterial hypertension the flow might or might not be reduced without signs of failure. These workers concluded the reduced blood flow preceded clinical evidence of advancing heart failure. Further, they found that reduced vital capacity, reduced "mean velocity of blood flow and rise in venous pressure occurred in the order named with the onset of circulatory insufficiency. The latter was noted only when failure was pronounced."

By the method described they were able to estimate the pulmonary circulation time (6.5 sec.). Marked increase in pulse rate slightly increased pulmonary circulation time. No relation was found between velocity of pulmonary flow and age, and no relation appeared between pulmonary velocity and normal arterial or venous pressure changes in the systemic circulation.

The same authors from their experience in the study of emphysema state: "even severe chronic pulmonary emphysema does not necessarily obstruct the blood flow sufficiently to interfere with normal velocity of blood flow through the lungs. On the contrary, in some patients with emphysema the velocity of flow is increased."

Animals were exposed to low oxygen tensions by *Campbell* and he found that in those adversely affected heart failure with passive congestion was the most constant feature.

Campbell and Sale have discussed respiratory exchange and the effect of exercise in heart disease. The equivalent of ordinary walking in three patients with heart disease did not cause the metabolism rate to vary greatly in relation to the patients' weight indicating that capacity for increasing ventilation and circulation, rather than any change in the metabolism or total ventilation required, limits exertion.

Enderlen and Eismayer's findings agreed with the views of Langley that organs with autonomic innervation continue to be influenced by sympathetico-dynamic substances even after complete denervation.

Experimental aortic stenosis and regurgitation is usually associated with gradual hypertrophy of the heart, is the belief of *Eyster, Meek and Hodges.* The hypertrophy is preceded by a stage of dilatation usually passing off in part or completely in a few days. The heart with aortic insufficiency before hypertrophy fails to react to overload as effectively as normal. There are no electrocardiographic changes characteristic of early dilatation or hypertrophy subsequent to aortic lesions. Even extreme degrees of dilatation in normal hearts fail to cause significant electrocardiographic changes.

From dog experiments *Eyster* concluded "results show that a more important and controlling factor (in the production of hypertrophy) is not a simple response to increased work but is a muscle injury due to dilatation. The occurrence of this is alone sufficient to produce hypertrophy and it seems probable that hypertrophy of the cardiac muscle does not occur unless this factor is present."

The distribution of certain mensurations made from the frontal and lateral orthodiagrams of 424 human hearts, including normal subjects and cases of chronic heart disease, is presented by *Eyster.* The mensurations include the area and tranverse diameter of the frontal plane silhouette, and the retrocardiac space in the lateral plane. The former measurements are compared with the prediction tables previously published. It is found that the measurements in cases of clinical hypertrophy differ sufficiently from the normal to justify the conclusion that cardiac mensuration is a valuable method for determining the existence of cardiac hypertrophy, and compares favorably in its degree of precision with other useful methods applied to clinical medicine.

Goldstein and DuBois have discussed the effect of carbon dioxide on the circulation.

Harrison, Blalock, Pilcher and Wilson found chemical much more important than nervous control of circulatory minute volume.

Henderson, Haggard and Dolley found in studying fifty college students that the circulation of the non-athletic ones doubles from rest to exercise; or from basal rate to exercise it would have been tripled, whereas the athletic group showed a tripling and would have shown

a quadrupling respectively under the same circumstances.

Himwich and Loebel investigated the oxygen saturation of hemoglobin in the arterial blood of exercising patients suffering of various diseases, nine in all. Their results suggest that the volume of oxygen diffusing through the pulmonary epithelium is insufficient to saturate the hemoglobin in the pulmonary capillary bed in patients who are weak or ill. The limiting factor in exercise thus may be the pulmonary mechanism.

Holman and Beck assert that an increased flow of blood through the heart is a more effective stimulus to cardiac dilatation and hypertrophy than increased peripheral resistance. It may be inferred, therefore, that any great increase in the size of the heart observed clinically is in greater part due to dilatation and in lesser degree to hypertrophy.

Katz and Wiggers after an investigation of the influence of high systemic blood pressures on right ventricle and pulmonary circuit have stated "Our experiments confirm the interpretation of Anrep and Bulatao that changes in pulmonary arterial pressures result from changes in the contraction of right ventricular systole, and are not due to back pressure effects."

Lawrence, Hurxthal and Bock found that (1) in normal subjects the blood flow, pulse pressure, and tension of CO_2 in alveolar and mixed venous air samples *diminish* as one changes from the lying to the sitting or standing position; (2) in normal subjects the ventilation, metabolic rate, pulse rate, vital capacity and difference in tension between carbon dioxide in alveolar and mixed venous air samples *increase* from the lying to the sitting or standing positions; (3) too few abnormal subjects were studied but indications were that they would show different responses from the normal.

Under experimental conditions *MacWilliam and Melvin* state that the mammalian ventricle responds in two ways to changes of rate, whether or not these changes are caused by changes in the normal pace maker, by nerve stimulation or by abnormal or artificial stimulation.

In "Type I", the normal, premature or accidental beats tended to be of diminished force while delayed beats tend to be larger or stronger.

In "Type II" there is a range of interval which is approximately optimal as regards contraction force. Acceleration beyond the limits reduces size of beats. Optimal rate varies and it may be much higher than the ordinary heart rate of the animal. Single beats following an optimal or suboptimal interval show immediate and striking differences in size, not depending on changes in blood pressure but connoting special metabolic condition of the ventricular muscle in which recovery after a contraction is rapid and is followed by early decline in contraction power if another excitation does not occur after an interval of such duration as is suitable or optimal in the particular conditions of the muscle at the time. These phenomena are related to the "supernormal" phase in nerve and cardiac muscle of lower vertebrates. But the large beats are not supernormal but are a return to normal from the subnormal determined by suboptimal rate. The authors believe reduced contraction sometimes to be due to slowing but when the reduction is out of proportion to rate change that the reduction is due to a vagus effect causing reduction in force as well (a force depressing vagus influence).

The same is true of the cardiac sympathetics, that is they think that they cause not only augmentation in force of the contraction by increasing rate to the optimal level, but they also have a direct force augmenting action. Moreover, MacWilliam believes both auricles and ventricles are so affected, that is increased or decreased force resulting from (1) rate changes and (2) from direct actions of each nerve (augmentor and depressor) on the muscle.

The effect on the coronary circulation of changes in the cardiac rate was studied by *Miller et al.* both on the isolated heart and on the heart in situ. A reduction and an acceleration of the cardiac rate were, within certain limits, associated with a decrease and an increase in the rate of the coronary circulation. The most striking changes in the rate of the coronary flow were observed in those instances in which relatively great changes in cardiac rate were induced. It is suggested, however, that a heart cannot be accelerated progressively to extreme degrees with an accompanying increase in the coronary circulation. In the very slow cardiac rates induced by vagal stimulation, the rate of flow from the coronary sinus was reduced from 20 to 30 per cent. below that observed during the control period. The production of auricular or ventricular premature contractions did not have any significant effect on the rate of flow from the coronary sinus. In auricular fibrillation the rate of the coronary circulation either remained fairly constant or was moderately accelerated. The results seemed to depend on the rate and the force of the ventricular contractions associated with the absolute irregularity.

Moore and Binger injected starch granules intravenously causing embolism of the lungs which resulted in dilatation of the pulmonary artery and right ventricle and auricle.

Nissen and Wustmann showed in animal experiments that any hindrance to the movement in the diaphragm as obliteration of the phrenocostal pleural angle, mediastinopericarditis, emphysema and diaphragmatic pleuritis resulted in slowing down of the circulation in the inferior vena cava.

The work of *Peters, Bulger, and Eisenman* has suggested that high bicarbonate and low chloride is the typical result of conditions that produce anoxic anoxemia and at the same time interfere with the discharge of CO_2 from the pulmonary circulation.

Ringer outlines the method of Henderson and Haggard for measuring the blood flow and records the results in a series of normals and of cardiac patients with failure. He finds that the results of the authors of the method agree within an average deviation of —5 per cent. with the results of other workers using reliable methods.

Rogoff and Dominguez studied the blood pressure in adrenalectomized dogs and discovered no significant change in pressure during the period of health preceding the final few days of terminal symptoms.

Lambert, Hennequin and Merklin review briefly the literature concerning the theory of humoral transport of excitation. In their experiments they were unable to obtain an effect such as that obtained by Loewi.

Rylant's experiments seem to have confirmed Loewi's observations of the humoral transmission of the action of cardiac nerves, not only from one heart to another but using the same heart, that is returning the perfusate from the heart, the nerves of which were stimulated and obtaining an action similar to that obtained by exciting the nerves.

Starling and Visscher's researches have revealed the fundamental law that under constant conditions oxygen consumption and therefore energy output depend on diastolic volume. Increase in work, depends on increase in oxygen consumption which in turn depends on increase in diastolic volume or fiber length. At the same diastolic length of the fiber, a heart used more oxygen *per beat* when contracting slowly than at high rates. Slowing of the heart enables it to do a given amount of work *per unit* of time more economically however.

"The oxygen consumption of the whole heart bears a direct linear relationship to its diastolic volume" was the conclusion of *Hemingway and Fee* working on a similar problem.

Turner studied the circulatory minute volumes of healthy young women in reclining, sitting and standing positions and found that there was a decrease in minute volume output from recumbent to sitting to standing, the metabolism however rose and the pulse rate increased relatively even more than the metabolism. Thus quiet standing may well lead to fainting.

The analysis of the intraventricular pressure curve as summation of fractionate contractions has been given by *Wiggers*. One of the implications of his findings is the confirmation of the origin of the T wave, to wit that the trough or crest of the T wave is reached before the end of dynamic systole due to relaxation of fibers which just entered into the summation curve of the intraventricular wave.

Zwaardemaker was able to revive a heart which had stopped when perfused with a fluid containing no potassium by adding potassium, 2 mgm. per gram of heart muscle or by radiating from without by 0.8 mgm. of radium or its equivalent.

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3—Etiology and Etiological Types

(a) General

Myers reviews 1000 cases: 762 personal patients, 199 from the Cardiac Clinic of the Des Moines Health Center and 39 from the Chest Clinics held in various parts of the state. The order of frequency of the etiologic types is: rheumatic 17.86%, hypertensive 8.5%, arteriosclerotic 7.45%, angina pectoris 5.15%, arteriosclerotic and hypertensive 3.72%, and the syphilitic 2.29%. Adding arteriosclerotic, hypertensive, and combination of these two the per cent is 19.76 and is greater than the rheumatic 17.86%. In the group, heart disease was diagnosed in 50.9%, there being no definite evidence of heart disease in 49.07%.

Stone and Vanzant studied 915 cases and drew several interesting conclusions. (1) Rheumatic heart disease is 1.8 times as common in negroes as in white people. (2) Rheumatic is the least important etiological type. (3) Luetic heart disease is very important. (4) Hypertensive heart disease is the most important and is more common in the south than in the east and west. (5) Angina pectoris is rare in the negro. (6) Lues is relatively unimportant in the etiology of angina pectoris. (7) Arteriosclerotic heart disease is much more common in white people. (8) Renal impairment occurred in one-third of the cases of heart disease. (9) There was only slight difference in etiology in clinical and autopsy series.

White reported that "the mortality from heart disease in Massachusetts has apparently increased". Moreover heart disease is the commonest cause of death. White analyzed 3000 cases divided equally between hospital patients, general practice patients and consultation practice patients. Eighty per cent. had organic heart disease and in this group, 41 1/3% were of the rheumatic type, 20½% arteriosclerotic without hypertension, 13½% pure hypertension, 17½% hypertensive and arteriosclerotic, 4% syphilitic, 3% thyrotoxic, 2% subacute bacterial endocarditis, 21% angina pectoris in consultation practice, and 9½% in hospital practice, 3 to 6% coronary thrombosis, 1 2/3% congenital heart disease. One half of the purely functional cases were "effort syndrome" (10% of the whole series) 2½% fitted into no etiological group.

(b) Angina Pectoris

The author, *Danielopolu* considers the whole subject of angina pectoris and attempts to find guiding principles in its treatment. Danielopolu's theory of the cause of angina pectoris is that "owing to a defective blood supply (coronary disease) fatigue products accumulate in the heart," these irritate sensory nerves producing pain and reflex pressor stimulation (raised blood pressure, acceleration of rate, increased force of contraction and probably vasoconstriction). The malnutrition is supposed to be augmented by these effects which still further irritates the nerves. (The reflex pressor circle). The author believes treatment should interrupt the cardio-aortic sensory fibers while preserving the efferent fibers from medulla and upper area as destroying these would abolish the pressor mechanism.

Much of the book is concerned with anatomical description and investigation. Danielopolu concludes that "some of the sensory fibers traverse the inferior cardiac sympathetic nerves to the stellate ganglion, thence down the sympathetic trunk to the rami communicantes of the 2nd, 3rd, and 4th spinal nerves and that the pressor fibers from the medulla traverse the same route to the heart". Therefore, he considers it dangerous to touch these. "A number of other sensory fibers avoiding this route pass by way of the stellate ganglion and in the upper and middle cardiac nerves of the sympathetic and branches of the vagus. These can be divided without endangering the pressor mechanism."

However, Danielopolu advises an operation in two stages, first division of the sympathetic trunk above the inferior cervical ganglion, or the upper and middle cardiac nerves of the sympathetic, of the vagal branches descending into the thorax, of the rami communicantes of the last three cervical and first dorsal nerves and of the vertebral nerve running from the inferior cervical ganglion of the sympathetic. In the second operation, the trunk of the cervical sympathetic is removed above the inferior cervical ganglion.

Brow reviews the work done on angina pectoris and gives an historical account of the disease. Primary pathological causes and secondary individual susceptibility or sensitivity of the individual are discussed. Brow suggests that a reason why the coronaries do not dilate is that the degenerated heart muscle does not give off carbon dioxide as does the normal muscle and that it is the local dilating effect of the

carbon dioxide given off during activity of the normal muscle that causes dilatation of the coronaries and increased blood supply during increased effort.

The author discussed the usual measures in treatment except paravertebral injections.

The superior cervical sympathetic ganglion in angina pectoris was negative on histological examination according to *Clark*.

Willius and Giffin analyze 1560 consecutive cases of pernicious anemia with especial reference to the occurrence of the anginal syndrome. It occurred in 43 cases or 2.7%.

These authors conclude that in protracted anemia the heart is subjected to an over-load in maintaining the circulation and that the anginal syndrome is so produced and probably depends upon myocardial anoxemia and not upon aortic or coronary sclerosis. The average age of the subjects was 53.6; there were twice as many males as females. The anginal syndrome was as in other anginas. The anginal syndrome occurred chiefly in cases of long standing anemia. In one necropsy, only fatty myocardial change was noted.

Herrick has added three more cases to the four cases reported in 1918 of angina pectoris in severe anemia. Two of the recent cases had pernicious anemia and one had an anemia secondary to carcinomatosis.

Of fifty-five patients with angina pectoris examined by *Kahn*, forty-eight presented tender spots along the ribs or on pressure over the sternum. This sign was found positive in non-anginal cases in which there was aortic or myocardial disease. In individuals without heart involvement, tender spots on the chest wall were not found in any case. In cases of angina pectoris, the tender spots are most often located on the second, third and fourth ribs to the left of the sternum (fourth cervical and second and third thoracic), and over the second and third ribs in the outer part of the right pectoral region (fourth cervical). The tender spots on the chest wall persist for a long time after an attack of angina pectoris, and sometimes continue throughout the intervals between attacks. They are especially valuable in the differential diagnosis between myocardial lesions and disease of the upper abdominal viscera.

White and Mudd reported eight cases of angina pectoris in young people under the age of 30. Forty-two other such cases were found in the literature. It is more common by ten to one than coronary occlusion at this age. Rheumatic aortic regurgitation was common to all the cases reported.

(c) CONGENITAL HEART DISEASE

Abbott and Weiss give a very full discussion of congenital heart disease, a classification and a bibliography.

Lukin and Frey reported a case of complete heart block in a child of eight without symptoms.

McIntosh reported a case of complete heart block presumably associated with a congenital defect. The child was aged seven months. The rhythm was regular, at the rate of 60 to 64. Electrocardiogram showed complete dissociation. The child died one month later. There was no necropsy.

Shapiro has added the nineteenth case to the series of reported heart block in children. The child presented cyanosis and clubbing and had the signs of pulmonic stenosis. The jugular pulsations were 88, the pulse 44. The author comments on the relatively higher pulse in complete heart block in children.

Clark, Coombs, Hadfield and Todd reported five cases of primary disease of the pulmonary artery, two congenital, two arteriosclerotic, one syphilitic and expressed reasons for considering congenital abnormalities responsible for causation of arteriosclerotic localization there.

Block's case of ectopia cordis pectoralis was remarkable in that it was normal in other respects and in that it lived eight days, the longest lived in the literature being two days.

The essential features in one of the heart specimens described by *Gunn and Dieckmann* were: (1) a large aperture or communication between the two sides of the heart, involving the lower atrial and the upper ventricular septums; (2) a fibrous interatrial septum, the posterior attachment of which, together with the coronary sinus, is displaced to the right, and (3) a common atrioventricular canal bordered by five cusps—in the left ventricle, a small lateral and a large anterior, and in the right, a large anterior and small lateral and medial. The lateral corresponds to the posterior of the normal tricuspid valve. A mass of endocardial tissue, attached to the posterior margin of the interventricular septum, projected into the interventricular aperture. The second specimen presented, in addition to almost complete absence of the atrial septum, defects of the tricuspid valve, especially its medial cusp. The defect of the atrial septum is due to absence or degeneration of the septum primum, and to absence of the septum secundum. The rudimentary atrial septum is interpreted as the left valve of the sinus venosus. The defective medial cusp of the tricuspid is interpreted as being due either to failure of fusion of the right ends of the endocardial cushions or to deficient growth potentialities of the posterior cushions alone.

Kurtz, Sprague, and White reported four cases of congenital heart disease with interventricular septal defects and various associated congenital lesions. All had cyanosis, two had

clubbing. Three cases were autopsied. One is living aged 58, probably representing the tetralogy of Fallot.*

A patient, aged five years, sex not given, came under the care of *Mackensie* complaining of five days fever and malaise. There was a generalized scarlitiniform rash. The temperature was 102 degrees to 104 degrees. Past and family history irrelevant. On physical examination a loud blowing systolic murmur was noted over the whole precordium. Irregular hemorrhage spots were seen over both feet. Abnormal pulsation of peripheral arteries was not noted. The blood culture contained a nonhemolytic staphylococcus albus.

The child ran a septic course with numerous petechiae appearing and died nine days after entrance.

On the aortic valve at postmortem was a large reddish gray friable vegetation and below this on the ventricular wall two small abscesses. The aortic isthmus was constricted and there was a thin fold projecting into the lumen. Otherwise there were acute endarteritis of aorta, generalized small abscesses, infarcts of kidney and spleen, aneurysm of iliac artery and congenital malformation of lung.

The small hemorrhagic spots with pustular centers seen in this case are stressed as being quite different from the petechiae with white centers seen in subacute bacterial endocarditis.

Gentian violet used intravenously was without effect.

Webber reported a case of stenosis (coarctation) of aortic isthmus, with sudden death from rupture of cerebral aneurysm in an adult man, aged 40, capable of ordinary hard work. A very complete review of the literature on this subject is given. The diagnosis was made by palpating two large pulsating subcutaneous vessels on the anterior chest.

Zimmermann added another case of truncus arteriosus communis to the 23 previously reported in the literature. This case aged 25 years, was the oldest to come to necropsy.

(d) CORONARY CIRCULATION AND CORONARY DISEASE

Segall reviews the work of several investigators notably that of Grant and his collaborators on the comparative anatomy of the coronary circulation and of Anrep and Segall demonstrating, he believes, sympathetic vasodilator fibers affected reflexly (as decreased, cerebral blood flow causes augmented coronary flow) and vagus coronary constrictive fibers affected by changes in aortic pressure indicating that both afferent and efferent fibers are contained in the vagus.

Anrep et al have continued the study of the coronary circulation with the heart lung preparation. During the cardiac cycle they found that "the outflow from the drained coronary sinus is increased during systole and consists of three waves, the first closely following auricular contraction, the onset of the second occurring simultaneously with the beginning of the ventricular contraction and the third during the ventricular contraction". Inflow into the coronary arteries on the other hand is diminished during systole.

Smith suggests that decreased coronary flow associated with diminished diastolic pressure in aortic regurgitation and arteriovenous aneurysm is probably a factor in the development of hypertrophy and later of cardiac failure. Reduction or acceleration of cardiac rates are associated within limits with changes in rate of coronary flow.

Coombs discussed the symptoms and signs of coronary occlusion in 36 cases. The character and radiation of pain were stressed. Friction was noted in 16 cases, gallop rhythm in 10 cases, alternation of the pulse in 16, a sharp fall of blood pressure in 17, onset of auricular fibrillation in 2 and in another a tachycardia suggesting flutter. Nine patients survived. Senile heart was diagnosed in 29, hyperpietic heart disease in four.

Eichler reported the case of a man seized with cramp-like pains in the heart region while on a mountain journey high above sea level. Death followed in three days and coronary thrombosis, infarct and rupture of the heart was found postmortem.

Elliot quotes W. H. Welch as saying that arteritis is more common in influenza than in any other acute infection. The case was a man of 46 who was suffering from an acute infection possibly influenza. He developed symptoms suggesting angina questionable coronary thrombosis and possibly pulmonary infarcts.

Hamman found the occurrence of embolic phenomena of importance in reaching a diagnosis in coronary occlusion. Emboli occurred in four out of sixteen of his cases.

Harcourt, Moorehead and Gwyer recall that infectious thrombosis of arteries is well known in typhoid and has been found in other infectious disease. The case was one of staphylococcus aureus septicemia proved by blood culture with many phlebitides, pulmonary infarcts and finally fairly typical coronary thrombosis. She recovered only to develop signs of cardiac failure several months later and died.

Jegorow reported 17 cases, 8 with autopsy, of myocardial infarct, a term he prefers to coronary thrombosis because the latter may be absent. Hammer first recognized the disease clinically in 1878.

Pardee reported a case of complete clinical recovery after thrombosis of a coronary branch. The man was 38 and gave a typical history and his electrocardiogram showed characteristic changes.

Willius reviewed 700 cases of coronary

*This patient has recently died at the age of 59. Autopsy confirmed the diagnosis.

sclerosis. He divided this group into three types: Angina pectoris, 282; myocardial failure, 368; paroxysmal dyspnea, 50. There was also an occult group with little evidence of coronary disease.

(e) DIPHTHERITIC HEART DISEASE

Jones and White followed 100 cases of moderate (30%) and severe (70%) diphtheria for five to eight years and failed to find any evidence of chronic cardiac damage ascribable to diphtheria.

Nathanson found T negatively most often following diphtheria and it was evidence of severe myocardial injury. Later the T wave returned to normal. In other infections this is a less common finding and auriculo-ventricular conduction is more often impaired.

(f) ENDOCARDITIS

Acute Bacterial

Brebner's patient was sick two months with endocarditis of unknown etiology. A diplococcus, finally proved to be the gonococcus, was isolated. The diplococcus was found in smears from the massive vegetations which almost occluded the mitral valve.

Two hundred and seven cases of acute endocarditis are analyzed by *Cowan*. Four divisions may be recognized: terminal infections; infections consequent on acute disease elsewhere; the rheumatic group, and the nervous group. Only half the cases (104) were classed as "cardiac"; in the remainder the clinical symptoms indicated other than cardiac diseases. There were only twenty-two patients with petechiae, and eighty-nine patients in whom the occurrence of embolism was demonstrated postmortem. Only eleven of these involved the brain and seven the heart; thirty occurred in the lung, eighteen in the kidneys, and fourteen in the spleen.

Bungeler relates the case of a man, aged 65, who had had erysipelas with endocarditis as a sequel. Later, a mitral insufficiency developed. Finally, because of a nervous disorder, pyretotherapy was employed, a mixture of bacilli (components not stated) being injected to induce fever. In a few days symptoms of malignant endocarditis were manifested. Death resulted on the sixteenth day. Bacteriologic examination of the spleen disclosed B. proteus, B. pyocyaneus and gram-positive cocci.

Rhoads described a case of vegetative endocarditis due to meningococcus. Lesions of the myocardium resembling those seen in rheumatic fever were found. The literature is reviewed.

Subacute Bacterial Endocarditis

Davis and Ayman report two cases of subacute bacterial endocarditis with vesiculobullous skin lesions. The original lesions on both were vesicles on the face. Neither gave a history of rheumatism. At post mortem there was no evidence of old mitral stenosis. However, typical vegetations were found on mitral and aortic valves in both. Streptococcus viridans was isolated from the vegetations of one case.

Hurxthal reviewed 65 cases of subacute bacterial endocarditis from the point of view of differential diagnosis. Normal rhythm was present in all cases. The presence of auricular fibrillation is against the diagnosis. Ten cases showing central nervous system involvement was suggested by the spinal fluid findings. The white count was found to be variable. Hurxthal emphasizes the importance of reticulo-endothelial phagocytizing cells found in this disease. Clubbing of the fingers and cutaneous embolic phenomena were discussed, the diagnosis resting essentially on the latter.

Morrison found 145 cases at the Massachusetts General Hospital in twenty-five years, the number per year varying from one to sixteen. Only one had auricular fibrillation. No treatment was effective.

Pepper summarized the hematology of subacute streptococcus viridans endocarditis: (1) Anemia is the rule; it is of the chloroanemic type, (2) leucocytes vary but tend to stay within normal limits (3) monocytes with macrophages in the blood smear are very suggestive though not peculiar to the disease (4) thrombopenia is an open question.

Of 123 cases of subacute bacterial endocarditis *Rothschild and Sacks* found only one case of auricular fibrillation present in the bacterial stage and this occurred three days before death. In three other cases of fibrillation and one of flutter the disease had progressed to the bacteria-free stage. The observation that auricular fibrillation and active subacute bacterial endocarditis are practically mutually exclusive would appear to be of diagnostic value.

Twenty-eight cases of subacute bacterial endocarditis are analyzed by *Smith and Brumfiel*. There was a history of acute rheumatic fever and tonsillitis in fourteen; scarlet fever in five; chorea in two; oral sepsis in ten, and influenza in four. Asthenia was the initial symptom in ten cases; headache in four; abdominal pain in four; cough in five cases. Of twenty-one cases in which a positive blood culture was obtained once or more, the organism was identified as streptococcus viridans in all but two cases. Circumstantial evidence indicates, in many of the patients, that the tonsils, paranasal sinuses, and abscessed teeth seem the most likely avenues to the blood stream. It is rather striking that the general experience of others in finding that a large percentage of periapical abscesses yield pure cultures of streptococcus viridans was substantiated in certain of the cases by the recovery of an organism identical with that obtained from the circulating blood. Certain symptoms tended to prevail; in twenty-seven cases there was asthenia; in eighteen, loss

of weight; in twelve, anorexia; in eight, arthritis, and in fourteen, dyspnea. Some degree of recognizable anemia appeared in eighteen; obvious malnutrition in fourteen; a demonstrable cardiac lesion in all; demonstrable clubbing of the fingers in thirteen; petechial hemorrhages in twenty-two, and the spleen was palpable in eleven of the twenty-eight. There was sufficient clinical evidence to warrant the diagnosis of aortic insufficiency in nine cases; aortic stenosis in one; mitral insufficiency in twenty-one; mitral stenosis in fifteen; and congenital defects of the heart were suspected in four. Twenty-four cases showed unmistakable evidence of embolism. Albuminuria appeared in twenty-one cases. Treatment proved unsatisfactory.

Sprague has pointed out that the term "heart attacks" has been applied very loosely to a group of sudden or paroxysmal syndromes characterized by palpitation, dyspnoea, chest pain, syncope, cyanosis or convulsions. Some are related to the heart and some are not. In differentiation, a careful history, consideration of age and type of patient, general physical examination, x-ray and electrocardiograms must be employed.

Rheumatic Heart Disease

Seegal and Seegal have found that rheumatic fever is less prevalent in the hospitals studied by them since 1918 though a few of these hospitals have shown an increase in 1924 and 1925. They found the disease more prevalent in the northern regions of the continent.

Atwater believes that a study of the epidemology of acute rheumatic fever and related disease suggests a communicable infection caused by an organism invading from without. It is related to the streptococcus infections.

Gleich found evidence suggesting that negro children are less susceptible to rheumatic infections.

Acute rheumatism is hereditary, but, *Jones* says, this signifies merely that a child's constitution is such that—given unfavorable environmental surroundings—his inborn tendency thereto is evoked, while in other and more favorable conditions it would not have materialized. The influence of temperature, humidity, altitude or other environmental factors is truly speaking evocative rather than causative. The liberating stimuli that elicit the latent hereditary bias may be positive e. g., cold and damp, or negative, as lack of sunlight or vitamins. Hence, the degree to which the influence of heredity can be controlled will depend on the measure of accuracy attained in identifying the evocative stimuli responsible in individual instances.

In an attempt to answer a standing question *Kaiser* studied 20,000 tonsillectomized and 28,000 untonsillectomized children and concluded that the tonsil is a factor in the causation of rheumatism, scarlet fever, and chronic heart disease. The child with its tonsils out has a greater protection against these than his fellow with his tonsils, 20 to 30% in fact if he is not yet infected.

In 121,898 examinations of school children in Gloucestershire, England, during a fifteen year period, *Martin* found evidence of organic heart disease in 7%.

The report of the *Ministry of Health* Department calls attention to the fact that rheumatism occurs in poor homes and that many or all of the cardiac sequelae may be avoided if proper after care is instituted. The report recommends clearing up poor homes and establishment of proper hospital resources for rest or graduated exercise.

Small has discovered the Streptococcus "cardio-arthritidis" and has prepared an antiserum which helped seven out of nine cases of rheumatic fever treated with it. The organism when injected into rabbits produced acute arthritis comparable to acute rheumatic fever in the human. Aschoff-like nodules were produced on the heart.

Birkhaug reports the isolation from blood, tonsils, heart and urine of patients with rheumatic fever of 68 strains of a non-methemoglobin-forming streptococcus related to but distinguishable from the streptococcus viridans and the streptococcus hemolyticus. Forty-nine of these strains (72%) produce a soluble toxin which caused positive skin reactions in 56 to 76 per cent. of persons with rheumatic fever history and in only 15 per cent. of those without such history, and when injected repeatedly intravenously and subcutaneously caused polyarthritis.

Birkhaug also reports the regular isolation of a new non-methemoglobin forming, inulin fermenting, bile-insoluble, toxigenic gram-positive streptococcus from tonsillar crypts and abscesses, and the inconstant isolation of the same organism from blood cultures, heart vegetations, urine and feces of individuals with rheumatic fever. Soluble toxin production by this streptococcus (72%) was far greater than that by streptococcus hemolyticus (0%) or by streptococcus viridans (4.7%) but slightly weaker in potency than that of streptococcus scarlatinae and streptococcus erysipelatus. A large percentage of persons with a definite history of rheumatic fever gave a positive skin test with the soluble toxic filtrate.

The blood culture technic was as follows: (1) sterile surgical precautions. (2) Mollen beef infusion agar 3% Ph. 7.8. (3) into petrie dish and allowed to harden and then into incubator 37 c. In three positive blood cultures colonies were visible in 24 hours, and distinct in reaction toward blood in 48 hours. The author is hesitant about growths in blood agar plates subsequent to 72 hours, particularly of growths in which repeated opening of flasks for smears renders them liable to contamination.

Boas and Schwartz believe that the lungs play an important part as a path of infection in reactivation of rheumatism, there being a close relation between broncho-pneumonia and rheumatic carditis. The tonsils play a relatively minor role in this respect. The authors believe the ordinary chronic hospital care is harmful and that an extended sanatorium treatment is indicated.

Landeau found among 130 cases of erythema nodosum in children, aged one to fourteen years, only one instance of rheumatic affection while in 136 cases of rheumatic type of disease (polyarthritis, chorea, endocarditis) he found 4 cases of rheumatism in the past history. In general his conclusions did not support the theory of a similar etiology for erythema nodosum and rheumatic disease.

Mackie among other interesting observations stresses his findings that only after the age of 25 does the incidence of heart involvement fall below 50% in the initial attack of rheumatic fever. This author advises a modified sanatorium regime in treatment.

Poynton reports six cases, one showing many nodules without any other evidence of grave disease, one case being initiated by acute heart block. Another patient showed enlargement of the thyroid gland coincident with severe cardiac rheumatism. Three cases exhibited dumbness with the chorea.

Of 160 cases of rheumatic heart disease studied by *Willius*, the disease occurred most commonly in the fifth decade (forty-seven cases). Only seventeen patients were more than 50. The sex incidence was equal. The first attack occurred before the age of 30 in 136 cases and before the age of 20 in 103 cases. The primary infection occurred in only five cases after the fortieth year. The average age at the time of death was 32 years. Death from gradual heart failure occurred in 147 cases, while sudden death occurred in eight cases. Five patients died from subacute bacterial endocarditis.

Barach reported a case of acute rheumatic heart disease treated with streptococcus antitoxin (scarlet fever serum), a boy 3½ years old, ill with acute rheumatic fever, cardiac enlargement, apical systolic murmur, nodules, and petechial spots. The blood culture was negative.

The rheumatism was relieved by salicylates. Ten cc. of Lederic scarlet fever streptococcus antitoxin intramuscularly relieved the symptoms within 24 hours and apparently produced a cure within a week. The author refers to a case reported by Toogood, Lancet 2:545, 1926.

Gunn used intravenous injections of gentian violet in treatment of rheumatic carditis in ten cases, apparently uninfluenced by tonsillectomy and the usual regime. He found eight definitely improved, one unimproved and one did not receive a fair trial. The treatment was based on the "coccal" origin theory of rheumatic fever.

McMillan and Stroud gave the results in convalescent care of 225 children over a period of five years and concluded the country convalescent homes and prolonged sanatorium treatment are necessary to deal with rheumatic fever. They found evidence that rheumatism remained active for long periods in spite of the apparent health of the patients otherwise. There was no evidence of contagion among the patients in their experience.

Robey and Freedman studied 454 cases from the Boston City Hospital and reported "the prompt subsidence of fever and joint symptoms following tonsillectomy in cases of acute rheumatic fever" . . . "since operation during the height of the febrile attack has not proved disastrous", say the authors, . . . "we hope that it will diminish the possibilities of cardiac involvement".

St. Lawrence holds that a rheumatic child with a rectal temperature not over 99.6 degrees for ten days should resume activity quite rapidly.

(h) SYPHILITIC HEART DISEASE

Clawson and Bell reported 126 cases of luetic aortitis; aortic insufficiency occurred in 36.5 per cent., closure of the mouths of the coronaries with sudden death happened in 25 or 19.9 per cent. Rupture of aortic aneurysm caused death in 27.7 per cent. Gumma in the myocardium was found in 2.4 per cent. Luetic aortitis was found in 2.6 per cent. of autopsies on adults over twenty years of age.

Heimann studied 105 cases of cardiovascular syphilis all with positive Wassermann reactions. The average time between chancre and entrance to the hospital was 24½ years. Dyspnoea and pain were by far the commonest symptoms.

Heller found the probability of mesaortitis in luetic subjects is 1:9 to 1:7. One half of these die from it but only 1.9 per cent. die under fifty years of age.

Matusoff and White concluded from a study of 25 cases clinically and from the autopsy findings in 35 cases of congenital syphilis that involvement of the heart and blood vessels is rare.

Scott states that latent syphilis is an important cause of heart failure only when it attacks the root of the aorta spreading to the valves by way of the vessels at the commissures causing the leaflets to become adherent to the adjacent intima. Syphilis at the aortic root is a progressive disease.

Microscopic changes in the myocardium are not characteristic and should not be regarded as latent myocardial syphilis.

A study made by *Turner and White* of fifty cases of early syphilis did not show any definite clinical evidence of disease of the heart or aorta in any case. A study of the literature shows that clinical evidence of cardiovascular disease in early syphilis is rare.

(i) MYXOEDEMA AND THYROID HEART DISEASE

The work of *Blalock* and *Harrison* indicated that cardiac output is increased by hyperthyroidism and is decreased by hypothyroidism, and that in the former condition digitalis decreased cardiac output as did iodine. The work was done on dogs.

Fahr reported six cases of heart failure in the presence of myxedema and he finds it characteristic and relieved only by thyroid extract; hence he designates the condition "myxedema heart".

The electrocardiographic observations in 787 cases of thyroid hearts are given by *Goodall and Rogers:* 242 cases showed impaired conduction in the bundle of His; 184 cases, a left sided preponderance; 113 cases, a modification of the T wave in the third lead; 108 cases, a right sided preponderance; ninety-one cases, auricular fibrillation; forty-six cases, modification in the T wave in lead II; thirty-three cases, modification in the Q-R-S complex; twenty-three cases, modification in the T wave in lead I; nineteen cases, ventricular extrasystoles; five cases, right branch block, and five cases, auricular extrasystoles.

Phillips and Anderson reported 120 cases of auricular fibrillation with hyperthyroidism. Seventy-five cases were operated upon with 43 or 60% restoration of normal rhythm. When no restoration is obtained, the authors recommend quinidine. They found digitalis was more effective in controlling the rate after thyroidectomy. In their opinion auricular fibrillation has no relation to the type of goitre.

(j) AYERZA'S DISEASE AND OTHER MISCELLANEOUS TYPES

Ayerza's disease "is due to a sclerosis of the pulmonary arteries often proved syphilitic in origin, and occurring as a sequel to a preceding chronic bronchitis. The outstanding clinical features are chronic cyanosis, dyspnoea, erythrocytosis, somnolence, prominence of the pulmonary artery in the Roentgen ray and right ventricular preponderance in the electrocardiogram". "Dilatation and sclerosis of the pulmonary arteries are the striking and unusual features of the necropsy findings". Somnolence is a symptom stressed by the author, *Cheney.*

The diagnosis depends upon the clinical picture: chronic productive cough, dyspnoea, intense cyanosis, erythrocytosis, somnolence, headache, vertigo, angina hypercyanotica and hemoptysis plus characteristic x-ray picture and electrocardiographic findings and finally evidence of lues. The syndrome may be given by anthracosis, chronic infectious pulmonary sclerosis or asthma and emphysema. In Ayerza's disease we must find primary pulmonary arterial sclerosis and endarteritis. Cheney reports two cases and reviews forty from the literature.

The clinical and anatomic characteristics of primary sclerosis of the pulmonary artery are described by *Bacon and Apfelbach,* and a report is made of one case that the authors believe is typical of this disease. They wish to separate this disease entirely from Ayerza's disease which is an ill-defined group of diseases in their opinion.

Among 210 pulmonary arteries of patients aged from 20 to 95, *Costa* found in 65 per cent. hyperplastic or degenerative hyperplastic lesions, evidently a sign of atherosclerosis. Only 8 per cent. of the total and 12 per cent. of the involved specimens exhibited gross lesions. There is a type of pulmonary atherosclerosis strictly associated with senile changes and not with chronic cardiopulmonary disease. From the age of 60 years on, that condition is constant in men and almost so in women. In men it may even develop earlier (about the thirtieth year). The histologic change is usually thickening of the intima. The pulmonary artery has absolutely no connection with the aorta, as regards atherosclerosis. Among 100 cases with serious aortic lesions, the pulmonary artery was found untouched in forty-five; while in fifty-four of 100 other cases the process was reversed.

So far from finding any unfavorable effects on the heart of long standing bronchial asthma, *Alexander, Luten and Kountz* have stated "that the increased intrathoracic pressure which occurs during an asthmatic paroxysm may impede the return of venous blood, and that the work of the heart thereby actually may become diminshed.

Christian found clinical and pathological evidence to justify the diagnosis of chronic emphysema with secondary cardiac involvement. In these cases congestive failure when it occurs is of bad prognostic significance.

Deutch and Kauf, as the result of x-ray studies on a large number of athletes engaged in different sports, concluded that exertion does have an effect on heart size and that the sports most likely to have this effect are rowing, cycling and skiing. The enlargment produced may be only temporary. There tends to be a familial factor in those cases subject to such enlargement caused by sport.

Hyman has considered the so-called "doctor's heart". He reached the following conclusions:

1. In a group of 100 physicians with cardiovascular disease, a high incidence of extrasystoles was noted.
2. A great increase in blood pressure was not found.
3. The types of heart disease discovered did not differ in any way from that found in other groups within the community.
4. While it is true that cardiovascular disease is the greatest cause of death among physicians, the belief that there is a clinical entity known as the "doctor's heart" is without foundation.

Reid is of the opinion that in the ill balanced diet and unhygienic manner of living found in most persons affected by obesity there is a partial explanation of the unfavorable influence of obesity on the heart. Statistical evidence is presented that patients who are obese are prone to develop chronic arterial hypertension and diabetes, and either of these diseases leads to arteriosclerotic changes in the organs of the circulation. It may well be that this arteriosclerosis is the cause of the more serious impairment of the heart in some cases of obesity.

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(To Be Continued)

UNDULANT FEVER

The United States Public Health Service reports that undulant fever, contracted from cattle and hogs which are infected with contagious abortion, is being more widely recognized as a problem of considerable importance from a public health standpoint. A number of cases of this disease have been reported from various States.

The disease of contagious abortion is quite prevalent among cattle and hogs throughout the country. Persons who drink raw milk from infected cattle or who handle hogs or cattle that are infected are likely to contract the disease. The name, "undulant fever", is applied to the disease because the attacks of fever come in waves or undulations. The disease was first recognized on the island of Malta in the Mediterranean, and it was thought for a time that it was spread only through the milk of goats. It is now known, however, that the disease may be contracted from cattle and hogs. The disease is not only disabling but extremely chronic in duration. The patient may be ill for two or three years before any improvement is noted. Important studies made by Miss Alice C. Evans, a bacteriologist of the United States Public Health Service, have shown the relation between this condition in human beings and contagious abortion in cattle. In certain States it has been said that undulant fever is of greater importance from the standpoint of public health than is typhoid fever. Many cases are contracted from infected milk. Fortunately, however, efficient pasteurization readily destroys any of the germs of this disease which may be present in milk. The chief precautions, therefore, are the use of pasteurized milk and care when coming in contact with animals known or suspected to be infected with contagious abortion. In a series of cases of undulant fever recently studied among adults living on a farm there were 39 males and 6 females; six of the male cases are known to have derived their infection from hogs.

MASSACHUSETTS DEPARTMENT OF EDUCATION

Division of the Blind

During the year ending November 30, 1927, 447 new cases of blindness in adults were reported to the Division of the Blind for investigation. Of these, 13 were found to be not legally blind, 12 had moved out of the State, 13 had died, 1 was given industrial aid in the form of advertising, 3 were aided in the sale of their products through the Blindcraft Shop, 74 were given instruction by the home teachers, 106 were given information and advice, 27 were granted financial aid, 5 were found employment, 158 were found to be in no need of assistance, 19 could not be located, and 46 cases were pending at the close of the year.

The Massachusetts Eye and Ear Infirmary referred 256 cases of adults, 213 of whom were registered.

The division was in touch with 2,569 adults and 1,170 children to whom varied types of assistance was rendered.

The year brought five cases of ophthalmia neonatorum—the largest number in several years.

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 15021

HYPERTENSION AND HEMATEMESIS

MEDICAL DEPARTMENT

First admission. A Newfoundland dressmaker fifty-four years old entered complaining of epigastric pain and hematemesis. She gave a history of dyspnea on exertion and life-long palpitation which had been increasing in severity. She had had two operations, removal of the right breast for lumps in the scar of an old burn at thirty years and a gall-stone operation with appendectomy the year before admission. Her blood pressure was 135/75 to 160/80. X-ray examination showed a constant irregularity of the duodenal cap. She was operated upon, an ulcer was found and a posterior gastro-enterostomy performed.

Second admission. Four years later she was in the hospital for a month with an attack of bronchopneumonia. The operation had given complete relief of her gastro-intestinal symptoms. She now had dyspnea and also occasional attacks of vertigo. For several years she had taken medicine off and on for high blood pressure. For four or five years she had had occasional headaches with spots before her eyes. For nine years she had had attacks of nosebleed, at first severe, coming on about three times a month with no obvious cause, sometimes at night. Five years before admission she had one which lasted nine hours. She went to a relief hospital, where the bleeding was allowed to continue on account of her blood pressure. Since that time she had followed by medical advice a salt-free diet with no fish or meat, and had had only two nosebleeds.

Examination showed the left border of dullness 2 centimeters outside the midclavicular line. Aortic second and pulmonic second sounds both accentuated. A systolic murmur at the apex. Artery walls not palpable. Blood pressure 185 to 175/85. Non-protein nitrogen reached 101.7 milligrams, returning to normal during convalescence. Two of seven urine examinations showed a slight trace of albumin, specific gravity 1.014 to 1.006. Renal function 25 to 35 per cent.

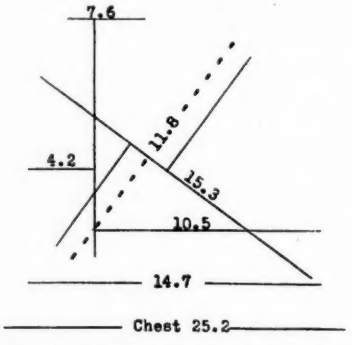
Third admission. Ten months after her last discharge she was readmitted after vomiting coffee-grounds vomitus three times that morning, in all perhaps seven pints. She had had no other gastric symptoms since her operation.

She now had no palpitation. She occasionally felt as if her heart "turned over". She sometimes had a little swelling of the ankles.

Clinical examination showed pallor. Many small purpuric spots on the lower legs. The apex impulse of the heart was found in the fifth space, 10 centimeters to the left of midsternum, 2.5 centimeters outside the midclavicular line, coinciding with the left border of dullness, right border 4 centimeters to the right, supracardiac dullness 6.5 centimeters. Action regular. Sounds of fair quality. Aortic second sound ringing. A soft systolic murmur at the apex and a soft blowing systolic murmur, slightly different in quality and earlier, at the base, loudest to the left of the sternum. Pulses equal. Artery walls palpable and slightly tortuous. Blood pressure 190/100 to 185/85. An electrocardiogram showed normal rhythm, rate 70, questionable intraventricular block, questionable left ventricular preponderance, marked left axis deviation.

Urine not remarkable. Renal function 15 to 40 per cent.

X-ray showed the anastomosis apparently functioning well. The heart shadow was distinctly enlarged. (See diagram).



She did well on a bland diet without alkalies and was discharged in twenty-four days.

History of interval. For the next ten months she felt very well and was able to work hard and enjoy it, although her systolic blood pressure remained about 250 to 260 all the time. She had occasional periods of distention and belching of gas and occasional swelling of the feet with urination once or twice at night relieved by rest, decreased diet, fluids and tablets given by her physician. For a week or two before her fourth admission she felt rather weak and tired easily. Three days before readmission she felt exhausted and passed two black fluid stools. The following day she passed two rather tarry stools. The next day she felt quite well. She had one tarry stool. The morning of readmission she was awakened by abdominal discomfort as if from gas. She had nausea and some left epigastric soreness. After examination by a physician she vomited two large basinfuls of blood clots.

Fourth admission, January 23, ten months after her last discharge.

On examination she was rather obese, perspiring profusely and complaining of feeling faint. Skin pale and moist. Many petechiae about the ankles. Heart sounds of good quality. Rate rapid. A systolic murmur all over the precordium. Blood pressure 170/100 to 100/60 to 180/80.

Urine: amount normal, specific gravity 1.022 to 1.012, the slightest possible trace to a trace of albumin at 3 of 7 examinations, leukocytes at all, red cells twice. (No record of a catheter specimen.) Renal function 20 to 30 per cent. The blood showed secondary anemia. Wassermann negative. Non-protein nitrogen 69.5 milligrams January 28, 37.5 February 11.

Under absolute rest and a milk diet, gradually increased, the patient improved. February 20 she was discharged.

History of interval. For the next year she felt fairly well. Then after feeling tired for a month she had a very severe nosebleed and vomited bloody vomitus with great force. After two weeks in a hospital she went back to work. For a month or two she was very tired, somewhat dyspneic and had occasional attacks of pitting edema of the feet, disappearing overnight. A year later, two years before her final admission, she began to feel nervous, and a few weeks later in a fit of anger became aphasic. In two days this passed off. A year before her readmission she lost weight. Since that time she had felt much better and had had no frequency. She had had occasional scotomata since discharge. Two weeks before readmission she began to have nightly chills. A week before readmission she vomited. For four days she had had cough (she spoke of "asthma") and for a few days bloody sputum and pain in the anterior right chest and sternum on cough. The day of admission she had several attacks of breathlessness not relieved by two injections by a physician. She had not stayed in bed until the day of admission.

She showed a very marked degree of mental defect similar to that seen in arteriosclerotics. The history was considered reliable only in a general way.

Fifth admission. June 16, four years after her last discharge, she entered the Emergency Ward with a temperature of 104°.

Clinical examination showed a somewhat undernourished woman lying against a back rest breathing rapidly, with irritative unproductive cough. Skin hot and dry. Apex impulse of the heart in the fifth space 10 centimeters to the left of midsternum, 2 centimeters outside the midclavicular line, coinciding with the left border of dullness. Right border of dullness doubtful. Supracardiac dullness 4 centimeters. Action regular. An occasional dropped beat. Sounds of good quality. A rough systolic murmur over the precordium. Somewhat rough crackles heard close to the ear along the left border of the sternum, possibly pericardial friction. Pulses normal. Artery walls palpable and tortuous. Blood pressure 200/100 at admission, 230/103 June 28, 140/85 July 18, 180/80 July 21. An electrocardiogram showed normal rhythm, rate 90, marked left axis deviation, inverted T_1, high T_2 and T_3. Lungs: Dullness at the right base and axilla with harsh sticky râles.

Amount of urine normal, specific gravity 1.002 to 1.020 (a two-hourly test July 5 showed 1.008 to 1.017), a very slight trace to a trace of albumin at all of ten examinations, sediment of a catheter specimen loaded with leukocytes. Renal function 10 to 30 per cent. Blood: 24,100 to 6,800 to 28,900 leukocytes, polymorphonuclears 85 per cent, hemoglobin 75 per cent, reds 4,016,000, smear normal. Hinton negative. Non-protein nitrogen 65 milligrams June 25, 49 July 12, 65 July 19. Stools: Guaiac positive at one of six examinations. Vomitus: guaiac negative. Sputum, mouse test: mouse died in eight hours; many pneumococci recovered which did not agglutinate with the usual type of serum.

X-ray showed some mottled dullness at both bases suggesting a pneumonic process.

At entrance temperature 104°, pulse 119, respirations 48. June 17 to 23 temperature 98.5° to 100.3°, pulse 80 to 101, respirations 25 to 41. June 24 to July 17 temperature usually not remarkable, once 99.8°, pulse normal except for one record of 100; respirations usually normal; increased to 30-40 on seven days.

The morning following admission the temperature fell abruptly before polyvalent serum was given. The patient appeared worse, however. June 18 there was dullness at the right base with coarse râles at both bases and squeaks throughout the lungs. Two days later the lungs seemed clearer. By June 22 she was off the dangerous list. She showed some cyanosis of the lips and tongue. Digitalis was started. She had some anorexia and vomiting; otherwise she continued to improve. By July 1 there were very few râles. She complained of nausea and some dimness of vision. An electrocardiogram showed rate 60, marked left axis deviation, possible intraventricular block, diphasic T wave in all leads. X-ray showed that the dullness at the base had decreased considerably since the last note. There was still, however, slight mottling.

July 17 she felt weaker and was nauseated. In the night she had a series of chills and became incontinent of urine and feces. In the morning she was much weaker, temperature 97°, pulse 90, respirations 30, blood pressure 142/82 to 150/100. The white count was 17,000, the reds 4,800,000. The stool gave a strongly positive guaiac and showed red cells on microscopic examination. The blood pressure fell until no

sounds could be heard. 500 cubic centimeters of blood was given by transfusion. The temperature fell to 96.5°, the pulse rose from 77 to 136, the respirations from 20 to 56. Later the blood pressure returned to 140/80, the pulse gradually fell to 90, the respirations to 28. The next day the pulse, blood pressure, respirations and general appearance approached the usual condition. She did not however answer questions. Her eyes were half closed, the right more than the left. The neck showed varying degrees of rigidity. Two days later the only change was a rotary nystagmus. The pupils did not react. That night there was an increase in pulse and respirations. The patient seemed cold, with cold extremities. Blood pressure, (pulsus alternans), systolic, some beats came through at 160, all at 120; diastolic 90. The nystagmus persisted. The eyes were drawn to the right. The right pupil was fixed, the left reacted sluggishly. The right lid drooped. The face was turned to the right. The neck was moderately stiff, as before. The left arm was catatonic, the right flaccid. She did not move the right leg. The left knee-jerk and ankle-jerk were very slightly greater than the right. A lumbar puncture showed normal pressure, no block; fluid faintly xanthochromic, alcohol, ammonium sulphate and Wassermann faintly positive, cells, 12 lymphocytes, 699 red blood cells, many crenated, colloidal gold 1112210000, total protein 70. After the lumbar puncture she had vomiting associated with shaking. The following day she vomited all nourishment and was incontinent. That night the abdomen was distended . On palpation she groaned. The blood pressure fell to 102/55. There was hyperpnea, rapid pulse, coma and incontinence. July 25 she died.

Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

1. She had had dyspnea before her second admission.

2. Allowing the bleeding to continue was good treatment, I think.

3. One may believe this statement about a salt-free diet if he likes. But anybody who has tried it knows that it cannot be endured for that length of time. I think she reduced the salt in the diet, taking less than most people.

4. The urine examinations at the second admission show on the whole pretty good renal function.

5. Patients often say the heart "turned over" apropos of an extrasystole.

6. At the third admission she was pale, I suppose, because of the vomiting of blood.

7. These are the murmurs which we get with almost any big heart. They are not necessarily of any significance aside from that.

8. The renal function at the third admission was not remarkable I should say.

9. The diagram shows the diameter of the heart a good deal more than half that of the chest. We say it should be distinctly less than half.

At the fourth admission there is no record of a catheter specimen, so the urinary sediment is not important.

10. She came in for a hemorrhage from her old ulcer, I suppose, and rested up and went along. It is quite possible that the hemorrhages from her ulcer are relieving her blood pressure.

11. We read a great deal in novels about people being speechless with rage. I do not know whether this is a functional type of aphasia, such as any one of us might have if we got mad enough, or whether it was something more. Two days is a long fit of anger. I think probably it was not functional aphasia.

12. Before her fifth admission she had been having chills, which are quite a new symptom in this record.

NOTES ON THE PHYSICAL EXAMINATION

1. There is a good swing of urinary gravity.

2. I get a good deal more out of the X-ray report than I do out of the plates. The record says "mottled dullness at both bases suggesting a pneumonic process," and of course everything else in the case suggests the same.

3. By July 1, I take it, the lungs are out of the picture.

4. On July 17 she is having a big hemorrhage, presumably intestinal. They seem to have done her much good by this transfusion.

5. They got the pulsus alternans as they took the blood pressure readings, which is of course the best way to get that sign.

6. She seems to have a right hemiplegia.

7. The essential point in the lumbar fluid was blood. I should think the lymphocytes could be accounted for by the irritation of the blood itself.

DIFFERENTIAL DIAGNOSIS

Certain things are clear. She certainly had a chronic hypertension, and we have every reason to suppose she had a hypertrophied and dilated heart. Her kidneys on the whole I should say we have no good reason to suppose diseased. She has been through two attacks of what may well be pneumonia. There is a possibility of this last one being pulmonary infarct, which cannot be ruled out in any way that I see. She is said to have coughed up blood, but that occurs with pneumonia as well as with infarct. She has this peptic ulcer, verified at operation, which has bled a number of times, presumably bled when she was here. And then she has had these cerebral symptoms. So we have three systems in the body attacked, the circulatory, the gastro-intestinal, and the nervous system.

I think I have said all I know about the first two, except that it seems to me there is a good

chance that she had an intracardiac thrombus and that pieces of that went into the arteries. She might well have had an infarct in the lung.

Now as to the cerebral symptoms, with blood in the lumbar fluid and hemiplegia. I think we have to say cerebral hemorrhage. She is at an age and with a condition of hypertension that often go along with cerebral hemorrhage. I do not see any reason why she should not have it. I think we had better say she has.

So we have to make three diagnoses, hypertension with enlarged heart, cerebral hemorrhage with hemiplegia, and a peptic ulcer with repeated hemorrhage. Whatever she had in her lung seems mostly if not wholly cleared up. I do not know whether it was pneumonia or infarct, but I should guess it was pneumonia. I think that is as far as I can go.

A STUDENT: The left side is more spastic than the right.

DR. CABOT: In fresh hemiplegia we are looking for flaccid paralysis. It seems to me the hemiplegia is right-sided. The chief point against that is that the knee-jerk on the left is slightly greater than on the right. I do not know how to account for that.

A STUDENT: Cerebellar trouble?

DR. CABOT: Of course a number of things are here recorded that suggest cerebellar symptoms. That is a difficult diagnosis to make. A great many of the special tests were not made in this case. I do not think there is anything more to be said about that.

Let us see if anything more is said about the localization of the hemorrhage. "The eyes were drawn to the right. The right pupil was fixed, the left reacted sluggishly. The right lid drooped. The face was turned to the right." That seems like spasm of the muscles on that side rather than on the opposite side. "The left arm was catatonic, the right flaccid. She did not move the right leg." I do not feel at all certain, but I think I shall stick to my previous statement that the right side was most affected.

A STUDENT: Might it be a cord hemorrhage?

DR. CABOT: What symptoms of cord hemorrhage have we?

A STUDENT: A flaccid arm is a symptom of that rather than of brain hemorrhage.

DR. CABOT: I can not agree to that statement. I can remember very few cord hemorrhages, so that I am not on a good basis of actual experience in discussing this. So far as I know, outside of poliomyelitis it is a very rare thing.

A STUDENT: Isn't it true that when we have a lesion of the upper motor neuron we get a spastic rather than a flaccid paralysis?

DR. CABOT: No. The vast majority of hemiplegias as we get them fresh are flaccid. They do develop spasm later.

A STUDENT: Why was there no rise in the blood pressure?

DR. CABOT: I do not believe I can answer. I suppose the amount of blood was not large enough, the amount getting down into the free spaces was not large enough. I should suppose there would have been a rise.

A STUDENT: Do you call the blood in the lumbar fluid a hemorrhage?

DR. CABOT: Yes. I suppose they have ruled out the possibility of the blood being due to their technique. The xanthochromic color, even though slight, is against its being a traumatic leakage.

A STUDENT: Wouldn't a pontine hemorrhage account for all these symptoms?

DR. CABOT: Yes, I should think it would.

A STUDENT: What is the cause of the purpura?

DR. CABOT: We have a good general "catch-all" term for that type. In chronic diseases, tuberculosis, cancer, diabetes, there are vessel changes I suppose which result in petechiae. You will find in all lists of purpuras the "cachectic type." It comes in chronic disease, and that is about all we can say. I do not believe they are embolic.

A STUDENT: Do you think the terminal symptoms might suggest a perforation of the ulcer?

DR. CABOT: I had not thought of it. I remember something about tenderness, that she groaned when they pressed on the abdomen. That seems to be all the evidence. I do not think it is very strong. It is possible.

A STUDENT: Isn't there usually more pain from an ulcer?

DR. CABOT: No, I should not say so, after the gastro-enterostomy. Gastro-enterostomy does not stop hemorrhage, but it does usually stop pain.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Arteriosclerosis.
Hypertension.
Chronic nephritis.
Hypertensive heart disease.
Bronchopneumonia.
Cerebral hemorrhage.

DR. RICHARD C. CABOT'S DIAGNOSIS

Chronic hypertension.
Hypertrophy and dilatation of the heart.
Cerebral hemorrhage, right hemiplegia.
Peptic ulcer.

ANATOMIC DIAGNOSES

1. *Primary disease.*

Primary hypertension.
Cerebral hemorrhage and softening.

2. *Secondary or terminal lesions.*

Duodenal ulcer (healed scar).
Posterior gastro-enterostomy (old).
Vascular nephritis (benign type).
Arteriosclerosis.
Hypertrophy of the heart.
Bronchopneumonia.

DR. TRACY B. MALLORY: Most of our findings check pretty well with the clinical diagnosis. She had a severe degree of arteriosclerosis, shown in the kidneys, the coronary arteries, and especially in the cerebral vessels. There was no closing of the coronary arteries however. The heart was considerably hypertrophied but otherwise negative. The kidneys, although showing a marked degree of arteriosclerosis of many of the vessels, did not show any diffuse vascular process of the smaller arterioles and the glomeruli, which we ordinarily feel is necessary to make a diagnosis of vascular nephritis.

The scar of the gastric ulcer was present, but to all gross appearances the ulcer had healed and was covered over completely with mucosa.

She had three areas of softening in the brain, an old one in the left temporal lobe, a more recent one in the left occipital lobe, and a still more recent, presumably the final one in the right occipital lobe.

A STUDENT: Did you find any reason for vomiting the blood?

DR. MALLORY: No, we did not.

A STUDENT: What was the immediate cause of death?

DR. MALLORY: The final cerebral hemorrhage.

A STUDENT: How about the distended abdomen, the question of peritonitis that was raised?

DR. MALLORY: It did not show distention at necropsy.

The lungs showed just the final traces of a resolving bronchopneumonia, almost entirely cleared up.

A STUDENT: Did she have essential hypertension?

DR. MALLORY: I guess so.

DR. CABOT: The cases that we are surest of in calling them essential hypertension are those in which there is no considerable arteriosclerosis. I think most of us do not any longer believe that arteriosclerosis produces hypertension. Most of us believe the other way. But there are still some people who believe that arteriosclerosis produces hypertension and who therefore would be slow to call it essential. This showed a good deal of arteriosclerosis, didn't it?

DR. MALLORY: It showed a good deal, but not a diffuse type. My experience here is that a relatively minor degree of change present in all the glomeruli produces symptoms, whereas with marked changes present in many glomeruli but the remainder negative there are rarely symptoms of renal insufficiency.

A STUDENT: Is this senile arteriosclerosis?

DR. MALLORY: You can call it that, but I do not know that it is different from any other type.

A STUDENT: Why did she have retention products, a high non-protein nitrogen?

DR. CABOT: Why did it go up so high? I don't know.

DR. MALLORY: She had pneumonia twice when that was high.

DR. CABOT: I have nothing to say.

A STUDENT: Could it be associated with the arteriosclerosis?

DR. CABOT: Why should it go down, then? Arteriosclerosis does not go down. That is permanent. It is hard to put a temporary rise to a permanent cause.

A STUDENT: Will you explain how she got bleeding when she had been treated surgically?

DR. CABOT: The ordinary explanation, that is clear enough in most cases, is that the ulcer does not heal. It is not the ulcer that gives the pain. It is the motor disturbance of the stomach. Here Dr. Mallory says the ulcer has been healed. Of course it is perfectly conceivable that the hemorrhages were from some other portion of the intestine. It is possible to have hemorrhages from small vessels that we cannot find after death. I think that is what we have to say in view of the healed ulcer. We talk about "renal nosebleeds". Here is an "intestinal nosebleed".

A STUDENT: The last time she had that gastric hemorrhage was four or five years before she died.

DR. CABOT: I thought there was something suggesting it—the positive guaiac—the last time.

I should say then that in essentials we have come out right. Those who said the hemorrhage was on the right side were correct and those who said it was on the left were also correct. I think you rather vanquished me in that the most recent one was right. I should think that was rather against me and in favor of those who said it was right.

CASE 15022

TREATMENT IN AN OBSCURE GASTRIC CASE

MEDICAL DEPARTMENT

An unmarried Irish-American saleswoman fifty years old came to the Out-Patient Department January 26 complaining of "bilious attacks" with vomiting.

For over fifteen years she had had these attacks about once a month, generally lasting for two days. They usually began at night with nausea, vomiting, palpitation and some headache and dizziness. She often had pain under the left lower ribs. The last attack, January 1, began an hour or two after supper. She felt nauseated, dizzy, and vomited. Her heart pounded. She went to bed, and continued to vomit. Later she slept until the following noon. She always felt very weak after the attacks.

Her family history is not significant.

She had pleurisy with drainage of effusion at thirty-one. For years she had pain in the lower abdomen, relieved by operation for fibroid

uterus at thirty-eight. Her catamenia ceased at this time. She had dyspnea and palpitation on exertion. Her bowels were irregular. She urinated two or three times at night, and had incontinence and frequency during the day. She was nervous. Since October her weight had fallen with change of diet from 196 pounds to 184.

Clinical examination showed a well nourished, slightly obese woman with poor teeth and pyorrhea. The head, throat and lungs were normal. The heart was not enlarged. A systolic murmur was heard at the apex and the base. The artery walls were normal. The blood pressure was 115/80. The abdomen, glands and pupils were normal.

Temperature 99°. Pulse 102. Hemoglobin 60 per cent. Urine normal. Wassermann negative.

February 9 she reported that on February 6 she woke up at midnight with sour stomach and vomited a pint of bitter yellow-brown liquid. The red blood count at this visit was 4,100,000, the smear normal.

Discussion

BY R. W. MC ALLESTER, M.D., A. V. BOCK, M.D., AND D. F. JONES, M.D.

Dr. McAllester: Cholecystitis was considered as a possible diagnosis, although pain when present was under the left ribs.

Pernicious anemia with gastric symptoms was suggested by the low hemoglobin, but the red count was 4,100,000 and the smear was normal.

Vomiting accompanied by pain, coming on at night, suggested duodenal ulcer. The acuteness of the attacks and their short duration were against ulcer.

The patient is of the right age for cancer and has lost weight. She has had these attacks for over fifteen years, and was as well between them as ever. Moreover the loss of weight was said to be due to a change of diet, and she apparently needed to lose more.

Gastric neurosis was thought of as a possibility.

FURTHER HISTORY

X-ray examination after the first visit showed the esophagus normal. There was a large diaphragmatic hernia, about half of the stomach passing into the chest. The stomach and duodenum were normal. X-rays of the gallbladder without the dye were negative.

The patient was advised to follow a concentrated low residue, low caloric diet under direction of the Diet Kitchen, to sleep with three pillows at night, and on her right side, to sit up rather than lie down after meals, to eat a very light supper or none at all, and to take a very moderate amount of liquid at night.

March 8 she reported that she was feeling very well. She had kept to her diet and had lost weight. On four or five occasions she had an "all-gone" feeling for fifteen or twenty minutes, then belched a little gas and promptly felt very well again. May 10 her report was the same.

November 15 she reported that she felt well as long as she kept to her diet. She had not kept an appointment in August because she was so well. In September she had an attack of palpitation and vomiting after breaking her diet at a late supper.

Clinical examination was as before. Fluoroscopic examination with the patient standing showed nothing. With the patient on her back after drinking barium a moderate sized hernia was seen coming through the esophageal aperture above the diaphragm, giving the stomach a constricted appearance. In the films about half the cardiac end of the stomach appeared above the diaphragm.

Further Discussion

Dr. McAllester: Attacks of indigestion coming on at night, with the patient in bed, accompanied by pain under the left ribs, nausea, vomiting, and palpitation, should have suggested diaphragmatic hernia. The condition is not rare enough to be unworthy of consideration in making a differential diagnosis. Many cases have been discovered which have not been reported. The diagnosis, as in this instance, is usually made by the roentgenologist.

When there is a congenital or acquired hernia of the stomach through the esophageal aperture of the diaphragm, there is usually a true hernial sac. The cardiac portion of the stomach may pass back and forth through the opening, depending largely on position and the stomach contents. The stomach is likely to protrude into the chest after a large meal and with the patient in the prone position. Constriction will cause pain under the left costal margin and in the left shoulder region. Nausea and vomiting occur. The presence of the stomach above the diaphragm with consequent pressure on the heart and lungs may cause palpitation, cough and dyspnea. There is more or less shock according to the degree of strangulation.

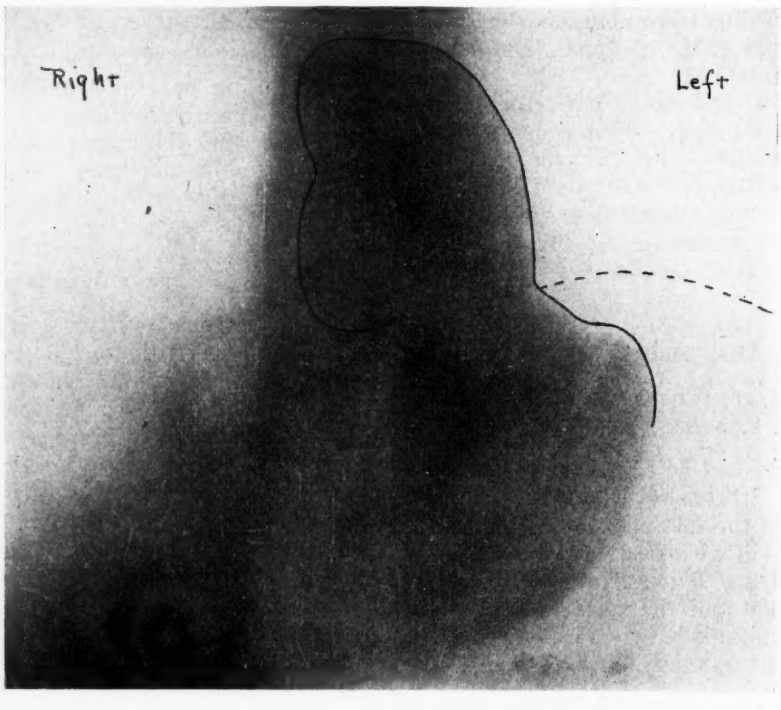
Eventration is a deformity of the dome of the diaphragm due to relaxation of the musculature. An elevation of the diaphragm results which may be confused with diaphragmatic hernia. In the latter condition there is a loss of contour seen in the diaphragm during fluoroscopic examination, and the stomach is seen entering the chest above the diaphragm.

If only a small portion of the stomach is above the diaphragm no physical signs may be elicited. If the hernia is large and acute the signs may simulate pneumonia. The signs may be those of hydrothorax, pneumothorax or hydropneumo-

thorax. The affected side of the chest may be prominent, retracted and motionless, with an outward flaring of the costal arch. Litten's shadow may be absent. The heart may be displaced to the right.

Hernia may also occur through the opening of the vena cava, the aortic opening, at the foramen Morgagni in front, the quadrilateral space behind, and at any point in the diaphragm which has been weakened by injury. In this case it is possible that the diaphragm was injured when her pleuritic effusion was drained.

lated cells 3 per cent. The smear showed 83 per cent polynuclears, increased blood platelets, and achromic red cells variable in shape. The bleeding time was normal and the coagulation time 7 minutes. In view of the negative findings except for the diaphragmatic hernia and repeatedly positive guaiac tests in the stools, carcinoma of the colon was considered likely and exploration advised. This was done by Dr. E. P. Richardson. No lesion was found in the gastro-intestinal tract. The hernial ring in the diaphragm was about three inches in diameter.



CASE 15022, PLATE I. Taken November 15. Shows about half the cardiac end of the stomach coming through the esophageal aperture above the diaphragm, giving the stomach a constricted appearance. In order to show in reproduction the hernia and the diaphragm have been outlined.

Almost any of the abdominal organs may enter the thorax.

DR. BOCK: Within the past year I have seen three cases of diaphragmatic hernia with what appears to be an unusual complication for this lesion, that of bleeding.

The first case, a woman, age fifty-one, a patient of Dr. Arthur Jackson of Everett, seen January 21, 1928, had complained for several months of weakness, dizziness and palpitation. Her only previous gastric complaint was that of gas, particularly after a full meal and noticed greatly on stooping over. Her bowels were constipated. Except for moderate pallor the physical examination was negative. The stools contained occult blood. X-ray examination of the gastro-intestinal tract including a barium enema, by Dr. Richard Dresser, was negative except for a diaphragmatic hernia, the hernial ring being apparently a dilatation of the cardiac orifice. Examination of the blood showed the following: hemoglobin 55 per cent, red count 3,800,000, leukocyte count 15,000, reticu-

Surgical repair of this was not attempted. During convalescence from the operation repeated examinations of the stools continued to show the presence of occult blood. The patient spent ten weeks in bed at home and with the exception of two or three weeks in September has been an invalid because of her anemia. On December 17, when seen again, the general condition was about the same as in the preceding January. The chief complaints were weakness, dyspnea, dizziness, palpitation, and gas in the stomach. Pallor was of the same order as before. The operative scar was in good condition. The hemoglobin was 55 per cent, the red count 3,000,000, the leukocyte count 10,000, reticulated cells 7 per cent and platelets increased. Stools of December 16 and 17 showed strongly positive guaiac tests. Proctoscopic examination by Dr. Chester Jones revealed a normal pink mucous membrane of the rectum and sigmoid.

The second case was a woman, age sixty-six, a patient of Dr. D. F. Jones, on whom the diagnosis of diaphragmatic hernia had been made

at the Rochester General Hospital several years ago. Two years ago she was studied again at the Strong Memorial Hospital, Rochester, where the X-ray findings suggested the possibility of duodenal ulcer in addition to the hernia. She had always had a good appetite for simple foods, with normal digestion. There was a history of periods of anemia for which she was put to bed for six weeks or more at a time during the past fifteen years. She could remember passing dark stools at times for four years. She had been confined to bed most of the time for the last two years. The physical examination was negative except for pallor. Occult blood was found in the stools. Her blood showed the following: hemoglobin 60 per cent, red count 3,800,000, leukocyte count 10,000, reticulated cells 2 per cent. Coagulation time 6 minutes, clot retraction normal, and normal icteric index. The platelets were increased and the rest of the microscopic picture was that of secondary anemia. Abdominal exploration by Dr. Jones revealed no lesion except that of the hernia.

The third patient, a woman of seventy-three, a patient of Dr. P. A. Brooke of Worcester, had been passing occult blood in the stools for at least two months. There was a history of tarry stools four years ago and the patient was kept in bed for three weeks. There was no history of indigestion. Physical examination was negative except for pallor. The diagnosis of diaphragmatic hernia had been made by X-ray at the Worcester City Hospital. Under fluoroscopic examination a large part of the stomach was seen extending well above the diaphragm. Some of the X-ray films showed the lesion so centrally placed as to suggest extensive dilatation of the lower end of the esophagus. The hemoglobin was 45 per cent, red count 2,500,000, leukocyte count 6,400, reticulated cells 3 per cent, platelets greatly increased, and the smear was characteristic of secondary anemia. The increase in blood platelets in these cases is generally associated with chronic blood loss.

CASE 15022, PLATE II. A plate from another case, showing the condition more clearly. D, diaphragm.

In a brief search of the literature no case of diaphragmatic hernia with bleeding of this character has been found. To account for the bleeding, it is conceivable that changes such as varices in the blood vessels of the gastric mucosa due to trauma, back pressure, etc., may well have resulted from the movement of the stomach wall against the hernial ring; or enough congestion of the mucous membrane of the stomach might be set up to produce generalized oozing from its surface. Changes in the capillary and arteriole walls associated with advanc-

ing age might account for bleeding that would be resisted in earlier years, given the same mechanical conditions. The writer has never heard any one mention diaphragmatic hernia among the causes for bleeding from the gastro-intestinal tract.

There is a report of but one post-mortem examination in a case of diaphragmatic hernia in the records of the hospital. This case was examined by Dr. H. I. Bowditch in 1846. The condition, however, is not rare, although comparatively few cases are recorded in the literature.

Dr. Jones: These three cases of diaphragmatic hernia through the esophageal opening reported by Dr. Bock are very strong evidence that the hernia may be the cause of gastro-intestinal hemorrhage, as the two conditions present in all cases were gastro-intestinal hemorrhage and diaphragmatic hernia.

On the other hand, it is difficult for a surgeon who has been in the habit of correlating the symptoms and pathology found at operation to believe that the hernia is the cause of the hemorrhage in Dr. Bock's second case. At operation a very careful examination of the stomach and lower end of the esophagus was made and nothing found to suggest any pathology. This might not be significant if the symptom of anemia had not been present for at least fifteen years. It is impossible to believe that an obstruction to the venous return could have been present at intervals for such a period without causing a dilatation of the veins in the vicinity of the esophageal opening or in the fundus of the stomach, or without some thickening or visible change in the stomach and esophageal walls. If there had been strangulation of the stomach or rubbing against the hernial ring, the peritoneum would have shown some callousing, which was not present.

If we were discussing a case in which the gastro-intestinal bleeding had only recently occurred, we might consider that the congestion of the mucous membrane caused by back pressure had produced a generalized oozing from its surface; but when we consider the time element in the case, it does not seem quite reasonable. Such a process long continued would have caused some thickening of the stomach wall which would have been evident to touch or sight.

It was not many years ago that much was heard about gastro-intestinal hemorrhage being due to erosions so small and so superficial that they could not be detected from the peritoneal surface. Congestion of the whole mucosa was also frequently spoken of as a cause of such bleeding. But I will venture to say that such conditions rarely if ever occurred unless there was some heart or kidney lesion or some blood disease present. As our knowledge has increased, we have only occasionally to fall back upon such diagnoses. That superficial erosions should remain as such for a period of fifteen years and never become chronic ulcers or cause sufficient change in the stomach wall to be noted at operation taxes one's imagination almost too much.

It seems much more logical to believe that the gastro-intestinal hemorrhage in these three cases was due to a polyp somewhere in the intestinal tract which cannot be easily found than to believe it is due to a congestion in the vessels of the stomach which has been present for at least fifteen years and yet produced no visible pathology.

NOTE BY DR. MC ALLESTER

On December 12, a month after her last visit, the patient in the first case reported again. She had had no further attacks. It was considered advisable to continue medical treatment in this case, on account of her comparative freedom from symptoms since treatment was instituted.

DIAGNOSIS

Diaphragmatic hernia.

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WHY ARE MALPRACTICE SUITS?

THE situation at the present time is that about once every four days some patient makes a claim against a physician, seeking legal redress for alleged malpractice. This represents a marked increase in the past ten years. What are the factors at work to produce this result? Is the increase accounted for by the greater number of cases for treatment? Are physicians more ignorant and less skillful? Are patients demanding higher standards in treatment and better results than physicians are educated to give? Are lawyers more eager to stimulate law suits? Are our legal procedures improving so that patients can more easily secure justice? It is difficult to catalogue all the factors that may be contributing to bring about the present condition, and to give to each its due weight. But there are grounds for believing that financial gain rather than seeking for justice is a pre-ponderating cause.

The workman's compensation laws have taken out of the field of controversy a considerable number of cases. Perhaps the lawyers who profit by controversy, having been turned out of one field, have stimulated the patients to mulct physicians or insurance companies so that the lawyers may share in the spoils. Perhaps physicians have, for pay, exaggerated their own assurance and have been eager to testify against fellow physicians, on points difficult to decide merely by evidence. Their opinion is weighted by love of lucre. "We need the money and after all it is the insurance company that pays".

Perhaps physicians in self-exaltation have condemned other physicians in their specific acts without knowing anything about the circumstances, and thus have stimulated malpractice suits.

In the practice of medicine there will always be, in the nature of the art, a large field in which if the physician chooses to do wrong, no one but he will know about it, until the Day of Judgment. No amount of enactment of specific regulation can appreciably limit this field without changing the nature of the art of healing. It is therefore of the utmost importance to have the right kind of physician.

The earliest responsibility then falls on the medical school, to restrict its degree to those who are morally and ethically qualified to practice medicine. The difficulty of making this determination does not absolve the school from responsibility. The next responsibility, in Massachusetts, falls on the Commonwealth, to restrict the license to practice to those who meet high standards. The medical practice act should be modified so that a high-minded and efficient Board of Registration can restrict the licenses to those well qualified in every way to engage in the practice of medicine. It is not likely that a rigid restriction of the practice of surgery will accomplish the desired result, though one difficulty at present is the practice of surgery by unqualified physicians. If only physicians well qualified in judgment are allowed to practice, they will be able to decide and will decide in the interest of the patient, who may properly operate, in a given case.

There are crooks and shysters practicing medicine, but the legal profession has its responsibility also in this regard, with its share of these "undesirable citizens". Legal procedure also is to blame, for jury trial does not always mean justice. Sometime ago, a poor woman brought suit against a wealthy traction company for injury for which she said the company was responsible. The jury after considerable debate was 11 to 1 against the company. The evidence had not shown responsibility on the part of the corporation, much less neglect. One juryman, who did not understand how these things are done, refused to take the corporation's money and give it to the woman, although the corporation was wealthy and the woman poor, and this was the easiest way to help her. His offer to contribute one hundred dollars to her support if each other juryman did the same, met with unfavorable response nor would the others come in when the ante was so small as

ten dollars. As a matter of principle he stood out, but the idea that money should arbitrarily be taken from those who have it to give to those who have it not, is becoming wide spread.

It may be that the prime movers in the malpractice suits are the patients who really feel that they have not been treated justly by their physicians.

But the situation is so serious in Massachusetts today that the medical profession, through its present organization, or, if for any reason that is inadequate, through special organization, should make as thorough a study as possible. What are the facts? Every claim should be investigated as thoroughly as possible, and all the information collected for study. Who is responsible for starting the suit? Patient, patient's family, lawyer, another physician? Especially the responsibility of the physician should be investigated. Is medical practice as bad as it would seem to be from the number of claims filed? Are the insurance companies stimulating suits to get physicians to take out insurance with them? Many of these facts are doubtless available already, but they should be before the organized medical profession for consideration, and for such action as may be necessary.

CHRONIC CYSTIC MASTITIS

One of the most uncertain and debated points in surgery today is the proper procedure to follow in cases of chronic cystic mastitis in women of cancer age. There is indisputable pathological evidence that retained secretion in the breast glands and ducts causes chronic irritation with inflammatory changes and hyperplasia of the epithelium. In certain cases this hyperplasia of the epithelium may be traced to the development of definite carcinoma.

Every pathologist must have had the experience of looking through the microscope at a case of chronic cystic mastitis where the dividing line between malignancy and a benign lesion was only the presence of an intact basic membrane about the masses of the proliferating epithelium cells. Unquestionably there are cases of chronic cystic mastitis which later turn to carcinoma. On the other hand, if every case of chronic cystic mastitis were treated as a premalignant case and the breast amputated there would be few women who had escaped mastectomy by the time they reached fifty.

In spite of all the study placed upon the problem we are as yet uncertain as to what is sound, conservative, surgical treatment of this lesion, and this in spite of the fact that it is one of the commonest lesions of the breast. Apparently for the present we will have to content ourselves with watching these cases of chronic cystic mastitis and at the first suggestion of a hard or a fixed nodule appearing in the tissue, resort to either exploration with an immediate frozen section for diagnosis, or else mastectomy.

THIS WEEK'S ISSUE

Contains articles by the following named authors:

Rosenau, M. J. A.M., M.D. University of Pennsylvania, 1899. Professor of Preventive Medicine and Hygiene, Harvard Medical School; Professor of Epidemiology, Harvard School of Public Health. His subject is: "Pasteurization." Page 51. Address: Harvard Medical School, Boston.

Hawes, John B., 2nd. A.B., M.D. Harvard, 1903. President, Boston Tuberculosis Association. His subject is: "Tuberculosis As An Industrial Accident." Page 55. Address: 11 Marlborough Street, Boston.

Garland, Joseph. A.B., M.D. Harvard, 1919. Physician to Children's Hospital Department at the Massachusetts General Hospital; Assistant in Pediatrics at the Massachusetts Eye and Ear Infirmary and the Harvard Medical School. His subject is: "Some Sidelights on the Thymus Vogue." Page 59. Address: 264 Beacon Street, Boston.

Johnson, Leighton F. M.D. Boston University School of Medicine, 1915. F.A.C.S. Consultant in Otolaryngology at the Evans Memorial Hospital. Clinical Assistant at the Massachusetts Eye and Ear Infirmary. First Assistant Surgeon at the Massachusetts Homeopathic Hospital. Instructor in Laryngology at the Boston University School of Medicine. His subject is: "Bronchoscopy in Acute Lung Abscess." Page 64. Address: 15 Bay State Road, Boston.

Ballard, James F. Director, Boston Medical Library; Secretary, Boston Medical History Club. His subject is: "The Value of a Medical Library." Page 65. Address: Boston Medical Library, Boston.

Palmer, Robert S. M.D. Harvard, 1925. Assistant in Medicine, Massachusetts General Hospital, Harvard Medical School. Address: 264 Beacon Street, Boston. Associated with him is:

Sprague, Howard B. A.B., M.D. Harvard, 1922. Assistant in Medicine, Harvard Medical School, Harvard Graduate School of Medicine and Massachusetts General Hospital. Acting Physician in charge of the Cardiac Clinics and Laboratory, Massachusetts General Hospital. Visiting Physician, House of the Good Samaritan. Address: 270 Commonwealth Avenue, Boston. They present a "Cardiovascular Review." Page 71.

THE CAMPAIGN CONDUCTED BY THE BOSTON MEDICAL LIBRARY AND THE MASSACHUSETTS MEDICAL SOCIETY

EIGHTY guests attended a dinner given jointly by the Boston Medical Library and the Massachusetts Medical Society in Holmes Hall, the reading room of the Library, Monday evening, January 7.

George E. Vincent, Ph.D., President of the Rockefeller Foundation, delivered an address on "Social Imagination". Doctor John W. Bartol, President of the Library, presided with Doctor John M. Birnie, of Springfield, President of the Massachusetts Medical Society, beside him as associate host. Others at the speakers' table were President A. Lawrence Lowell, of Harvard University; President John A. Cousens, of Tufts College; President Samuel W. Stratton, of the Massachusetts Institute of Technology; Dr. W. P. Bowers, Editor of the NEW ENGLAND JOURNAL OF MEDICINE; Mr. N. Penrose Hallowell, Mr. James Dean, Mr. Carl P. Dennett and Mr. Bradley Palmer.

In his opening remarks Doctor Bartol spoke of the value of gatherings in which business and professional men might discuss matters of mutual interest. While each group has its own specific duties and problems, each needs the sympathetic interest, advice and assistance of the other. The specific purpose of the occasion was to acquaint the guests with the reasons for the joint effort now being made by the Medical Society and the Library to secure funds for an addition to the Library building and permanent quarters for the executive offices of the Medical Society and for the NEW ENGLAND JOURNAL OF MEDICINE, its official organ, and to initiate the program for a Medical Center.

Following the address of Mr. Vincent brief remarks were made by President Lowell, Dr. Birnie and others.

Mr. Vincent's address was in part as follows:

THE SOCIAL IMAGINATION

(Abstract of an address by George E. Vincent, President of the Rockefeller Foundation, at a dinner of the Boston Medical Library, January 7, 1929.)

Controlled imagination utilizing tested facts is a source of power and progress. It projects plans, kindles enthusiasm and brings things to pass.

Most of the weaknesses of persons and societies can be traced to lack of imagination or to perversions of it. Selfishness and indifference to the common good are traceable largely to incapacity to see wider relations in life.

Such phrases as the "scientific imagination", the "historical imagination", the "poetic imagination" are well-known and significant. To these might well be added the "industrial or commercial imagination". The statesman can be distinguished from the politician chiefly by a wider scope of imagination.

The term "Social imagination" may be made to describe a person's relation to his immediate associates, to his community or to the nation. The United States is notable for the degree to which this type of imagination has found expression in civic co-öperation and the organization of voluntary effort.

Imagination may respond automatically to dramatic and vivid human needs as in the case of disasters by earthquake, flood, fire or tornado, or more spontaneously to the appeals of hospitals, dispensaries, crèches, nursing services, charities which meet the recurring demands of the sick, of childhood, of the poor and weak.

But there is also a reflective imagination which by conscious efforts traces less obvious relationships and sees more remote but really fundamental connections of things. For example, imagination of this kind realizes that so-called "pure research" must be stimulated if steady progress is to be maintained in applied science.

The plan of the Boston Medical Library and of the Massachusetts Medical Society to extend the facilities of the former and to create a Medical Center—all in the interest of the public health—challenges the reflective imagination of the people of this city and of New England.

At first thought a Medical Library seems less responsive to human need than a hospital, but on reflection one sees that the hospital's usefulness depends upon its staff of doctors, internes, technicians and nurses. These in turn are dependent upon a process of continuous education in which medical literature is a vital factor.

Only a person with an imagination of the automatic or at best spontaneous type would say: "I have no interest in a medical library; I should never use it". If only he would widen his grasp of reality he would see that it concerns him deeply to have his doctor, the medical profession, public health leaders currently familiar with the progress of medical knowledge and technique. To the social imagination this is clear.

The Boston Medical Library stirs the historical imagination as one realizes its development in which a high-minded and socially imaginative profession has played so public-spirited a part. It is especially interesting to laymen to remember Doctor Oliver Wendell Holmes's participation.

But it is now appropriate to project imaginatively the future of this library which must have shelf rooms for a great accumulation of books and journals, and provide space for growth of years to come. Research and experience send forth a widening stream of new knowledge and forms of skill. To these ideas doctors, medical students, public health officials and others must have free and continuous access if the community is to be truly served.

The enlarged building is to be more than a library. It will house the offices and meetings of the Massachusetts Medical Society with its NEW ENGLAND JOURNAL OF MEDICINE; it will provide quarters for public health agencies and conferences of many kinds; it will thus become a Medical Center, not in the sense of a combination of medical school and hospitals, but as a headquarters where the forces of curative and preventive medicine will take counsel together to safeguard and promote the health of the city and the state.

Yet this Center will be actually a part of one of the most notable areas of medical research, teaching and hospital service in all the world. Consider it for a moment: The Harvard Medical School, The Tufts Medical School; possibly also the Medical School of Boston University, the Harvard Dental School, the Forsyth Dental Infirmary, The Carnegie Nutrition Laboratory.

Then look at the hospitals: The Lying-In Hospital, the Children's Hospital, the Robert Bent Brigham Hospital, the Peter Bent Brigham Hospital, with their out-patient service with combined facilities for a large number of patients in most if not all of the fields of medicine and surgery.

This district is also important from the standpoint of public health education and administration. Here is to be found The Harvard School of Public Health. In the new building of the Library agencies which are working so effectively with the city health authorities in the significant White Fund Health Centers will have their main offices. If the tentative plan for moving the Boston Health Department into this district is carried out, the situation will be rounded out in an exceptionally favorable way.

The Library Medical Center will not only serve investigators, teachers and students in this region; it puts literature at the disposal of the larger Boston area and through the mails sends it to libraries and individuals in the state at large. Support should come from a wide area.

The campaign for the Library-Health Center will test the reflective imagination of the public in Boston and the State. The project does not conflict with the appeals of hospitals and dispensaries; it fundamentally supplements their needs. It is an enlightened program of progress in supplying essential literature, in strengthening the bonds of professional loyalty and efficiency, in promoting co-öperation for public health. It deserves and will undoubtedly receive generous support.

Invitations to the dinner were accepted by the following gentlemen:

Rodolph L. Agassiz
Philip R. Allen
James B. Ayer
Charles G. Bancroft
John Washburn Bartol
Junius Beebe
Alexander S. Begg
Horace Binney
John M. Birnie
D. D. Blaisdell
Gerald Blake
Herman L. Blumgart
Charles R. C. Borden
Walter P. Bowers
Gerald A. Bramwell
F. Gorham Brigham
Walter S. Bucklin
I. Tucker Burr
Charles S. Butler
G. Colket Caner
Josiah B. Chase
David Cheever
Paul Clarke
Russell S. Co[illegible]n
John A. Cous
Guy W. Cox
Courtenay Cr[illegible]
Henry B. Cu[illegible]ngham
James M. Curley
Charles P. Curtis
Louis Curtis, Jr.
Frederic H. Curtiss
Philip S. Dalton
Lincoln Davis
Hilbert F. Day
James Dean
Carl P. Dennett
Eben S. Draper
Carl Dreyfus
David L. Edsall
William C. Endicott
John W. Farlow
Russell G. Fessenden
Paul E. Fitzpatrick
Allan Forbes
J. Murray Forbes
Hollis French
Channing Frothingham
John L. Hall
N. Penrose Hallowell
Henry I. Harriman
Walter C. Howe
Louis E. Kirstein
James Lawrence
William Lawrence
Walter C. Lewis
Harry Linenthal
A. Lawrence Lowell
Joseph P. Manning
Arthur W. Marsh
Robert W. Maynard
Leroy M. S. Miner
Charles G. Mixter
Everett Morss
T. J. O'Brien
Charles F. Painter
Bradley W. Palmer
J. Harleston Parker
William C. Quinby
Francis M. Rackemann
Allan W. Rowe
Roger L. Scaife
George G. Sears
Henry L. Shattuck
Warren R. Sisson
Albert W. Stearns
James S. Stone
Samuel W. Stratton
Robert M. Tappan
Henry S. Thompson
George E. Vincent
Eliot Wadsworth
Richard G. Wadsworth
Edwin S. Webster
Edward C. Wheeler, Jr.
Edward Wigglesworth
Charles F. Wilinsky

The Massachusetts Medical Society

THE ATTITUDE OF THE COMMITTEE ON ETHICS AND DISCIPLINE REGARDING THE APPEARANCE OF A NAME IN "THE EXPERT"

December 28, 1928.

George Cheever Shattuck, M.D.
520 Commonwealth Avenue
Boston, Massachusetts.

Dear Doctor,

Relative to your letter to the Committee on Ethics and Discipline of the Massachusetts Medical Society concerning the attitude of the Society on inserting the name of a physician in a booklet entitled: "The Expert", published by the Riverside Press, Inc., 505 Minnesota Street, St. Paul, Minnesota, the Committee have investigated this publication and, at a meeting on December 20, 1928, voted that it is the sense of this meeting that the insertion of the name of a Fellow of the Massachusetts Medical Society in "The Expert" is contrary to the ethical standards of the Society. The Secretary was instructed to send you this letter and a copy to the official organ of the Society, the NEW ENGLAND JOURNAL OF MEDICINE.

Respectfully yours,

WALTER L. BURRAGE,

Secretary of the Committee on Ethics and Discipline, under the terms of the By-Laws.

COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1927 AND SEVEN YEAR AVERAGE

WEEK ENDING DECEMBER 22

DISEASES	1928					1927			
	Wk. ending Dec. 1	Wk. ending Dec. 8	Wk. ending Dec. 15	Wk. ending Dec. 22	Average cases reported for week corresponding to Dec. 22 for past seven years	Wk. ending Dec. 3	Wk. ending Dec. 10	Wk. ending Dec. 17	Wk. ending Dec. 24
Actinomycosis	-	-	-	-	-	-	-	-	-
Anthrax	-	-	1	-	-	-	-	-	-
Botulism	-	-	-	-	-	-	-	-	-
Cerebrospinal Men.	-	-	5	3	1	-	-	-	1
Chickenpox	110	105	184	124	78	94	67	120	130
Conjunctivitis Inf.	-	-	-	-	-	-	-	4	-
Diphtheria	15	30	36	34	50	43	37	59	41
Dysentery Amoebic	-	-	-	-	-	-	-	-	-
Dysentery Bacillary	-	-	2	-	-	-	-	-	-
Encephalitis Epid.	-	-	1	-	-	-	-	-	1
Favus	-	-	-	-	-	-	-	-	-
German Measles	10	7	16	18	5	2	-	-	5
Hookworm Infection	-	-	-	-	-	-	-	-	-
Influenza	5	4	14	144	6	5	9	9	15
Leprosy	-	-	-	-	-	-	-	-	-
Malaria	-	-	-	-	-	-	-	-	-
Measles	80	87	174	226	123	29	47	43	35
Mumps	24	33	124	14	22	49	25	27	39
Paratyphoid Fever	-	-	-	-	-	-	-	-	-
Pneumonia (Broncho)*	22	29	27	19	23	19	25	38	27
Pneumonia (Lobar)	27	37	50	38	32	30	33	47	39
Poliomyelitis	2	-	2	-	-	1	2	2	-
Scarlet Fever	31	38	55	52	103	68	70	70	65
Septic Sore Throat	-	1	2	1	1	1	2	2	2
Smallpox	7	1	-	1	-	-	-	-	-
Tetanus	-	-	-	1	-	-	-	-	-
Trachoma	-	-	-	-	-	-	-	-	-
Trichinosis	-	-	-	-	-	-	-	-	-
Tuberculosis (Pul.)	15	25	25	27	15	21	25	24	12
Tuberculosis (O.F.)	4	1	1	1	-	4	2	1	-
Typhoid Fever	3	8	-	-	5	2	3	1	2
Tularemia**	-	-	-	-	-	-	-	-	-
Typhus Fever	-	1	-	-	-	-	-	-	-
Undulant Fever**	-	-	-	-	-	-	-	-	-
Whooping Cough	21	29	40	32	43	94	123	109	117
Gonorrhoea	42	27	24	26	12	60	34	36	17
Syphilis	49	52	49	18	28	72	29	22	49

*Made reportable January 1, 1925.
**Made reportable July 1, 1928.
Remarks: No cases of Asiatic cholera, glanders, plague, rabies in humans and yellow fever during the past seven years.

CORRESPONDENCE

COMMENTS ON ANNUAL REGISTRATION OF PHYSICIANS AND THE REGISTRATION OF CLASS C GRADUATES

Editor, NEW ENGLAND JOURNAL OF MEDICINE,

My dear Sir:

A medical journal just like the human body must depend upon its circulation, and I therefore can assure you that if you publish this communication that said circulation will be improved.

I understand that a doctor connected with the New York State Medical Examiners is in this state explaining the good that would come to this Commonwealth if we passed a law that would have the doctors registered annually. There are therefore many doctors who believe that we should copy that law from New York. How about another regulation that exists in New York State, and that is that every candidate for license must be a graduate from a Class A school? Class C school graduates are not permitted to take license examinations in practically every state in the Union except two or three, and this state is one of them!

I have great respect for the State of New York and its laws and regulations, because I was born in it, and have been licensed to practice medicine and surgery, after graduating from the University of the State of New York, upon an examination back in 1909, but why not start the thing right by refusing to license graduates of Class C schools in this Yankee state! Later after this more important requirement has been taken care of, we can try to have annual registration of physicians. The man from New York is telling us all about annual registration. Why not have him tell us a whole lot about what he thinks of licensing poor doctors of Class C schools, who would likewise have to be relicensed yearly?

I may be dense with constipation of thought and diarrhea of words, but still I want to be shown how in the name of Socrates will it keep those fakirs from doing business, if the Board of Registration is not a prosecuting one. A fakir has more business zeal than a dozen professors and a dozen high hat theorists. He knows more about getting dollars than we know about getting the itch! All kinds of laws will not put one wrinkle in his eyebrows, nor one nail in his coffin. He will continue to do business as long as he can count money. It takes a fakir to catch another. Honest doctors can never find him long enough in one place to get a good look at him. Annual registration of physicians will never put him out of business, because he promises cures and gives guarantees, and that is what the illiterates and ignorant people want.

Several days ago, I talked with the Honorable Doctor Samuel B. Woodward in his bank parlor. He told me that he admired my letters, and for which I am grateful to him. He said to me: "More power to your elbow," and added that he enjoyed my style of writing, and that he read my last letter twice! He favored annual registration and advised me to think it over. I taught him something although he is a very wise man! I told him that midwives had no right to practice as such in this Commonwealth; that obstetrics was a branch of the practice of medicine; that certificates of birth contain the words, PHYSICIAN OR MIDWIFE affixed to them to designate which of the two was present at birth! And the law does NOT permit unlicensed people to practice! Still such blanks are to be obtained from a public official! If a male adult were to do midwifery, he would get arrested, while it appears that the midwife is exempt from interference. Who said that women were not born lucky? Who said that laws are the same for both men and women? Well, Fellows, you will have to prove to me that the world is square. I, just like Chris. Columbus, believe it to be round.

Sincerely yours,

MAX BAFF, M.D.

Jan. 5, 1929.

THE COST OF PASTEURIZERS

(LETTER TO DR. GEORGE H. BIGELOW)

Commissioner of Health

November 9, 1928.

George H. Bigelow, M.D.,
Commissioner of Public Health,
State House, Boston, Mass.

Dear Dr. Bigelow:

In response to your recent memorandum relative to the cost of pasteurizing apparatus, I have written a letter to the Wright-Ziegler Division of the Cherry-Burrell Corporation.

I have received a reply from Mr. Houghton enclosing estimates for the cost of pasteurizing apparatus for 250 quarts, 500 quarts, and 1,000 quarts of milk. The approximate cost given includes the pasteurizer, motor drive, vat outlet, recording and indicating thermometers, boiler with fittings and injector, milk and brine pump, motor drive, brine maker, dump receiving tank, milk pump, motor drive, filter, steam, water and milk pipe, fittings and labor, freight.

The cost for the 250 quart pasteurizer is $1,199.95, which is close enough to $1,200 to be more readily understood. The cost of the 500 quart pasteurizer is $1,824. The cost of the 1,000 quart pasteurizer is $2,474.

Yours truly,

HERMANN C. LYTHGOE,
Director, Division of Food and Drugs.

SIR JAMES Y. SIMPSON ON THE CURE OF CONTAGIOUS DISEASE IN THE FUTURE

Mr. Editor:

The following is from Simpson's Inaugural Address to the Medico-Chirurgical Society of Edinburgh, printed in the *Monthly Journal of Medical Science*, Edinburgh, April, 1853.

"We have, from the experience of the last few years, every reason to hope that the whole class of zymotic diseases will be greatly subdued betimes in intensity and violence, when the investigation of the physical causes predisposing to them, or even actually exciting them is more fully expiscated."

"If medicine has devised means to arrest the ravages of smallpox, may it not yet devise some means also, by inoculation or otherwise, to arrest the ravages of scarlet fever, and measles, of whooping cough, of typhus fever, and perhaps of the whole class of non recurrent diseases? And even if we fail to arrest them, we may possibly find out for the various animal

poisons, producing these diseases, antidotes as certain as quinine is against the poison of marsh fever."

"Let us at least not sit indolently down and argue ourselves into the belief that it is impossible to attain such results. The conquest of small-pox seemed to our forefathers, a hundred years ago, as impossible as the conquest of these maladies can look to any one now, and yet, we all know that the subjugation of small-pox was affected by the genius of one man and the devotion of one man to its accomplishment."

"Some time before Jenner turned his attention to the subject, the learned and accomplished Dr. Mead—the first London physician of his day,—wrote of the utter hopelessness of the very idea of battling with, and vanquishing such a formidable enemy to human life and happiness as small-pox. He speaks of the possibility of a "specific antidote being found against the contagious poison," of small-pox—that is an antidote "by which it may be so thoroughly destroyed, that though it had been received into the body, it may not produce the disease," as an idea as wild and chimerical as that of alchemy, and one in his opinion, outraging" the principles and elements of things that are so certain and so well established by the permanent laws of nature."

"These disheartening opinions of Dr. Mead regarding the hopelessness of ever gaining a prophylactic for small-pox, were published in 1747. Before, however, fifty years had elapsed, Jenner had both discovered and successfully adapted to practice, the great prophylactic measure that has rendered his name imperishable in the annals of the human race. And thus the happy results of Jenner's labors,—besides their own intrinsic and inestimable worth,—descend to us stamped with a precious lesson from him, of hope and perseverance under alleged impossibilities, for these results preach loudly to the profession in all time to come, that we should never permit any apparent improbabilities to prevent us from going always onwards in earnest search for possible means of conquering and curing diseases even of the most formidable and fatal kind."

Very truly yours,
WM. PEARCE COUES, M.D.

January first, 1929.

CHANGES AT PONDVILLE

December 31, 1928.

Editor, NEW ENGLAND JOURNAL OF MEDICINE.

Dear Sir:

May I through your columns announce the resignation of Dr. Isaac Gerber as Visiting Roentgenologist at Pondville. Pressure of other matters made it impossible for him to continue the very excellent service which he has given us since the institution opened. The Public Health Council accepted his resignation with regret and profound appreciation.

May I also announce the appointment of Dr. Richard Dresser, Assistant Roentgenologist at the Massachusetts General Hospital, as Visiting Roentgenologist at our Pondville Hospital. We are of course fortunate in this appointment as Dr. Dresser will continue the high standard of service already set at the institution.

Cordially yours,
GEORGE H. BIGELOW, M.D.,
Commissioner of Public Health.

THE TREATMENT OF ERYSIPELAS

Jan. 7, '29.

Editor N. E. J. of M.

I read with interest Dr. Tappan's paper on "A Treatment for Erysipelas" and the discussions which followed the paper.

I wonder if the physicians who objected to the ichthyol therapy on account of its uncleanliness, ever used it in the form I was using it during my thirty-five years of practice?

Instead of the greasy, unsightly salve, necessitating the wear of a masque, I use ichthyol mixed in collodion, which is painted over the affected parts daily, taking in ¼ of an inch of the healthy border. It dries quickly, stays put, and leaves a perfectly healthy skin after peeling.

I had invariably satisfactory results from its application in a solution of 15 to 25 per cent.

M. J. KONIKOW, M.D.

Boston, Mass.

CAPITAL INVESTMENT IN MEDICINE

American Medical Association
Bureau of Health and Public Instruction
535 North Dearborn Street, Chicago,
January 5, 1929.

Dr. W. L. Burrage, Secretary
Massachusetts Medical Society
185 Walnut Street, Brookline, Massachusetts.

Dear Doctor Burrage:

As you receive this letter, the questionnaires on The Capital Investment in Medicine will be ready to leave the headquarters of the American Medical Association. A very important group, composed of economists, publicists, physicians and others, has undertaken to make an investigation of the cost of medical care, the results of which will be of great importance to the medical profession. The American Medical Association has undertaken to collect information pertaining to the capital investment in medicine and the income from medical practice.

As a part of the work of the above-mentioned group, known as The Committee on the Cost of Medical Care, the American Medical Association is to request more than 25,000 physicians, selected at random, to furnish certain data pertaining to the invested capital involved in physicians' education, intern training, post-graduate courses, office and traveling equipment, office maintenance, medical society affiliations, library maintenance and medical licensure fees.

This, as you will realize, is a survey of the profession, by the profession, and for the benefit of the profession. The questionnaire is to be anonymous and, therefore, there need be no fear of any embarrassing or undesirable results from the information returned.

You are urged to encourage, among the members of your state society, a serious and thoughtful consideration of this matter to the end that complete and reliable data will be given on the several items. We desire that you suggest, through your medical journal, by news item, editorial and other appropriate means, the importance of this survey and the desirability of universal participation on the part of the physicians who receive the questionnaire.

Yours very sincerely,
R. G. LELAND, M.D.,
Director of Study.

RECENT DEATH

SYLVESTER—Dr. William Hillman Sylvester, a retired Fellow of the Massachusetts Medical Society, died at the Leonard Morse Hospital, Natick, of carcinoma of the stomach, November 10, 1928, at the age of 78. He was a graduate of the Medical School of Maine in 1876 and settled in Natick, Massachusetts in 1893, joining the State Medical Society. Dr. Sylvester was a member of the staff of the Leonard Morse Hospital. He was a Fellow of the American Medical Association.

OBITUARY

RESOLUTIONS ADOPTED BY THE SENIOR STAFF OF THE BOSTON CITY HOSPITAL AT ITS MEETING DECEMBER 20, 1928

That in the death on June 4, 1928 of their colleague, Howard Ames Lothrop, M.D., the staff of the Boston City Hospital has sustained a great loss.

That Doctor Lothrop's long term of service at the hospital, both as a surgeon and teacher, was characterized by his marked ability, his entire devotion to the welfare of his patients and his constant endeavor to promote the best interests of the hospital.

That through his constant endeavors to impart his surgical knowledge to those working under him and with him, his manual skill, his conscientious and keen pursuit of the best in surgery, and his high ideals, he attained a high position in his profession.

That as an expression of sympathy in their loss, a copy of these resolutions be sent to Doctor Lothrop's family.

P. F. Butler, *Secretary.*

The announcement of the death of Dr. Charles Montraville Green brings to us a feeling of profound sorrow and keen regret.

He was a member of the Hospital Staff for forty-four years and his constant and many-sided contacts with the great institution he so ably served, made this epoch one of great accomplishment. We recall with satisfaction and pride our happy and intimate relations with him during the thirty-two years he was a member of the Senior Staff and the period from 1907 to 1914 when he served as its President.

His untiring zeal and painstaking devotion to his work made him an invaluable member of the Hospital he served so well.

To his family we extend our deepest sympathy in their great loss and feel assured that their sorrow will be mitigated by the remembrance of the noble life he led.

P. F. Butler, *Secretary.*

NOTICES

AN UNAUTHORIZED SOLICITOR

We have just been informed that a person has been soliciting the payment of Massachusetts Medical Society dues and subscriptions to the New England Journal of Medicine in Worcester County. This is an old method of getting money by unauthorized solicitors. The regular method of paying the dues of the Society is through the State and District Treasurers and by no other persons, and no person other than reputable subscription agencies has been authorized to collect subscriptions for the New England Journal of Medicine.

UNITED STATES CIVIL SERVICE EXAMINATIONS

The United States Civil Service Commission announces open competitive examinations for the positions of Toxicologists, $3,800 to $4,400 a year, Associate Toxicologist, $3,200 to $3,700 a year, and Assistant Toxicologist, $2,600 to $3,100 a year. Vacancies in the Bureau of Mines, Department of Commerce, for duty in Washington, D. C., or in the field; in the Chemical Warfare Service, War Department, for duty at Edgewood Arsenal, Edgewood, Md.; and vacancies occurring in positions requiring similar qualifications will be filled from these examinations, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion. Applications must be on file with the U. S. Civil Service Commission at Washington, D. C., not later than January 23, 1929.

REPORTS AND NOTICES OF MEETINGS

HAMPSHIRE DISTRICT MEDICAL SOCIETY

A meeting of the Hampshire County District Medical Society was held at the Cooley Dickinson Hospital, Northampton, December 12. The President, Dr. O'Brien, introduced the first speaker, Dr. J. W. Bartol, who appeared in behalf of the Campaign Committee of the Boston Medical Library. He referred to the important relation between the medical library and the medical profession. It was the aim of the various committees promoting this enterprise to provide a medical center in New England, a home of medical reference where practitioners and investigators might avail themselves of a wealth of medical literature. Dr. Bartol outlined the scope of the work undertaken by the Campaign Committee. A thorough canvass was to be made of the members of the Massachusetts Medical Society with a view to enlisting, either directly or indirectly, the financial support of every one of its members. If each member would participate by a pledge of $100.00, to be given by himself or raised among friends of the medical profession, it would greatly enhance the prospect of an early success of the Campaign. Mr. F. H. Kent, the Campaign Director, dwelt upon the ways and means of raising the necessary funds and the sort of building the Committee had planned. The Library now owns enough land upon which the new building will be erected. A much needed stack room will be provided. Quarters will be provided for the offices of the Massachusetts Medical Society and a commodious meeting hall. The New England Journal of Medicine, which is the official organ of the Massachusetts Medical Society, the New England Pediatric Society and the New England Surgical Society, will also have its offices in the new building. For the success of this great movement Mr. Kent impressed upon his listeners the importance of a large participation on the part of the medical profession.

Dr. Truesdale of Fall River opened the scientific program with a paper on "The Relationship of the Surgeon and Physician in Dealing with Peptic Ulcer."

The reader referred to this disease as one which, in the course of its progress, brought into play many of the specialties. The departments of medicine, roentgenology, bacteriology, chemistry, dentistry, laryngology, gastro-enterology and surgery are called upon to furnish evidence for the intelligent management of these cases. There can be little doubt that many individuals have mild symptoms from a type of ulcer which gets well spontaneously and without the help of medical treatment. When a physician is called and makes the diagnosis usually from the history, he then seeks confirmatory evidence from the department of roentgenology and other valuable information from the dental, chemical and bacteriological laboratories.

Dr. Truesdale dwelt at some length upon the importance of the history. He believes that peptic ulcer frequently escapes detection because the history is neither pertinent nor complete. From the standpoint of his history there is something peculiar about the patient with peptic ulcer. In reciting his symptoms he complains of indigestion, distress after meals, sour stomach, acid eructations, nausea and occasionally vomiting, a group of symptoms more characterististic of appendicitis and cholecystitis than of ulcer. Thus, not willfully, he evades the whole truth by not telling enough of it. While he has the pathognomonic symptoms of ulcer, he fails to mention them in his story. Therefore, the examiner must violate a doctrine that has been, and still is commended in the method of inquiry: namely, never to ask the patient a leading question. If the examiner fails to ask him in a direct manner about a gnawing ache or hunger pain two or three hours after eating and when present, if it is relieved by food, it is not likely that this bit of information, indispensable for a correct diagnosis, will be offered voluntarily. In other words the physician should get the history, not merely take it.

When the diagnosis is established, peptic ulcer primarily becomes a problem of the physician. It is he who knows the patient's background, his family history, his habits, behavior, social and economic state. He knows the number of dependents and how seriously the disease is interfering with the patient's ability to provide for them. Therefore, the physician is best fitted to decide when medical treatment should end and surgical treatment begin. Because he is best informed, he will tell you that no rules can be laid down to govern all cases.

The subsequent management becomes a matter of judgment and conscience on the part of the doctor. Very meagre circumstances of the patient do not always warrant early operation; nor should the affluent patient be kept under medical treatment until he is the victim of obstruction, perforation or repeated hemorrhages.

Some distinction should be made between the treatment of ulcer of the duodenum and ulcer of the stomach. The incidence of malignant disease in the duodenum is negligible while the relationship of ulcer and cancer of the stomach is one which should not be put aside with a wave of the hand. The percentage of ulcers which degenerate into cancer has become a mooted question. Upon the subject there is a wide range of opinion among surgeons, internists and pathologists. The Mayos placed it at 65%, Finsterer at 21%, Pauchet of Paris 15%, Hugh Cabot 8.6%, Ewing 5% and Franklin White 2%. It is probable that this great variation in reports is due to different methods of compiling statistics and computing results. The Mayos have been misunderstood and their statistics misinterpreted upon one important phase of the problem. It was not their intention, I believe, to convey the impression that 65% of all cases of ulcer of the stomach become cancer, but that in 65% of their cases of cancer of the stomach they had obtained positive evidence, from the history or pathological study, of pre-ëxisting ulcer. That is quite different from an implied statement that 65% of all gastric ulcers become malignant. It is obvious that by far the major proportion of individuals with ulcer of the lip, mouth, cervix or colon never develop cancer because they are not predisposed to the disease. There are very few patients, however, with cancer of the mouth, lip or cervix who did not have a benign ulcerative process at the same site as, and antedating the appearance of, the new growth. Those who are congenitally predisposed to cancer probably carry over a 90% risk of developing cancer on gastric ulcer and such individuals as are not so predisposed to cancer probably carry less than a 10% risk to the degeneration of gastric ulcer into cancer. Somewhere between the two extremes is the general average covering all cases. Our experience leads us to a conviction that when the examiner is bent on getting the history, not taking it, the average is nearer 65% than 5%. Although the incidence of cancer of the stomach on ulcer is not generally expressed in these terms, it seems to me that this interpretation of available statistics from many sources is reasonable. We have obtained authentic evidence of pre-ëxisting ulcer in well over 50% of our cases of cancer of the stomach. Three of our cases with the clinical, operative and pathological diagnosis of ulcer died of cancer of the remaining segment of the stomach three, seven and eleven years respectively after operation.

The dual responsibility of the physician and surgeon in dealing with peptic ulcer should be approached with a view to the prevention of ulcer whenever that is possible: 1st, by periodic physical examinations; 2nd, by the removal of all sources of infection; 3rd, by personal hygiene; 4th, by discretion in diet, rest and exercise; and 5th, by the recognition of the early symptoms of ulcer so that application of corrective measures can be employed without delay. There is foundation for the belief that many patients with peptic ulcer could be spared the dangers of hemorrhage, perforation and the ordeal of operation by early diagnosis and intelligent treatment.

Our policy in the treatment of peptic ulcer is based upon several factors. Although the disease appears to pursue its sinister course with orderly manifestations for months or years, we have no rules that will wisely permit strict application. However, before embarking upon a plan of treatment we believe that a consideration of each case in the following order will be of assistance: 1st, family history; 2nd, age, duration of symptoms and habits; 3rd, frequency, periodicity and severity of exacerbations.

We are heartily in accord with the practice, now generally advocated, of giving medical treatment a fair trial. By a fair trial is not meant a few days or weeks but months or a few years as the circumstances warrant. If perforation or hemorrhage supervenes it cannot be charged up to medical treatment.

It is our belief that, inasmuch as two-thirds of the cases of peptic ulcer are in the duodenum, the majority get well spontaneously or by medical treatment and, therefore, are not seen by the surgeon. The chronic, recurring, indurated and obstructive type of duodenal ulcer should be treated surgically. We practice (1) radical surgery in the treatment of gastric ulcer, (2) gastro-enterostomy for the chronic indurated duodenal ulcer, (3) medical treatment in the early cases of duodenal ulcer and in the uncomplicated duodenal ulcer among comparatively young people.

In hospital practice there is intimate association of the physician and surgeon, especially as it relates to the treatment of peptic ulcer. Consultations in the hospital are made a part of the daily visit. As a result there is considerable opportunity for the surgeon to learn medicine and for the internist to see the truth revealed at operation. We are helped immeasurably by these frequent contacts and the opportunities they provide for understanding the point of view of some other branch of service. The medical education of the surgeon and the surgical education of the physician are thus fostered as they should be.

HARVARD MEDICAL SCHOOL

Professor Heinrich Poll of Hamburg, Germany, who is in this country as the first Abraham Flexner Lecturer at Vanderbilt University, lectured on Tuesday, January 8, on "Adrenalin, Insulin and Sexhormone from the Viewpoint of Their Inter-relationships."

THE WACHUSETT MEDICAL IMPROVEMENT SOCIETY

The Wachusett Medical Improvement Society met at the Holden District Hospital, Holden, Massachusetts, Wednesday evening, January 2, 1929.

After the business meeting Dr. Mark H. Joress, Boston, Mass., speaker of the evening, presented a paper entitled, "A Discussion of the Differential Diagnosis of Pulmonary Tuberculosis." Doctor Joress talked from the practitioner's point of view and therefore gave very little time to purely theoretical considerations. He made a brief but enlightening review of the conditions which simulate tuberculosis and which are most likely to mislead the diagnostician.

Dr. Ernest B. Emerson, Rutland, Mass., opened the discussion, and emphasized the point that it is extremely difficult in some cases to make a positive diagnosis of tuberculosis even with the help of the laboratory and the X-ray, and cited a few remarkable cases of mistakes in diagnoses.

Dr. George N. Lapham, Rutland, Mass., made a few remarks and reported a case of interest.

Dr. William B. Davidson, Rutland, Mass., gave his interpretation of some X-ray films.

The meeting adjourned at 10:30 P. M.

PAUL DUFAULT, M.D.,
Secretary-Treasurer of the Wachusett Medical Improvement Society.

THE SOUTH END NEIGHBORHOOD MEDICAL CLUB

The next meeting of the South End Neighborhood Medical Club will be held at the office of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, January 15, 1929, at 12 noon.

The speaker will be Philip H. Sylvester, M.D., Assistant Visiting Physician to both the Children's and Infants' Hospitals, Boston. His subject will be "Infantile Paralysis", and will be illustrated with lantern slides. All physicians are cordially invited to attend.

The usual luncheon will follow.

BOSTON ORTHOPEDIC CLUB

A meeting of the Boston Orthopedic Club will be held on Monday evening, January 14, 1929, in the Sprague Hall of the Boston Medical Library.

Business meeting 8:00 o'clock.

Election of officers.

Nominations:

President—Dr. Charles F. Painter.

Member of the Executive Committee for Three Years—Dr. M. N. Smith-Petersen.

Secretary-Treasurer—Dr. R. K. Ghormley.

Program 8:15 o'clock:

"Lymphatic Drainage of Joints," by Dr. John C. Kuhns.

"Open Reductions of Fractured Neck of the Femur," by Dr. M. N. Smith-Petersen.

R. K. GHORMLEY, *Sec.*

CLINICAL CONFERENCE OF THE NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

"The regular clinical conference of the New England Hospital for Women and Children, Dimock Street, Roxbury, will be held at the hospital on Thursday evening, Jan. 17, at 8 o'clock. The chief paper of the evening will be given by Dr. Isabelle D. Kerr on the subject: Technique of Speech; Throat Affections caused by Faulty Technique."

ALICE H. BIGELOW, *Secretary.*

SOCIETY MEETINGS

Combined Meetings of the Boston Medical Library, the Suffolk District Medical Society, the Middlesex South District Medical Society and the Norfolk District Medical Society (at Boston Medical Library at 8:15)

January 30, 1929—General meeting in association with Boston Medical Library. "Heredity," Professor George H. Parker, Harvard University.

February 27, 1929—Medical Section. "The Newer Knowledge of Nutriment," Dr. Lafayette B. Mendel (exact title to be submitted later), Yale University Medical School.

March 27, 1929—Meeting in association with Middlesex South District Medical Society. Clinical and Experimental Studies of Obstructing Jaundice and Its Complications. Dr. Waltman Walters, Mayo Clinic.

April 24, 1929—Annual meeting. Speaker, Dr. Walton Martin, New York City. Title to be announced later.

The medical profession is cordially invited to attend all these meetings.

January 10—Massachusetts General Hospital Staff Meeting. Complete notice appears on page 47, issue of January 3.

January 14—Boston Orthopedic Club. Complete notice appears above.

January 15—The South End Neighborhood Medical Club. Detailed notice appears elsewhere on this page.

January 17—Clinical Conference of the New England Hospital for Women and Children. Detailed notice appears elsewhere on this page.

January 29—Conference on Mental Hygiene in Public Health and Social Work. Detailed notice appears on page 1235, issue of December 13.

DISTRICT MEDICAL SOCIETIES

Barnstable District Medical Society

Schedule of Meetings: February 7, 1929, May 2, 1929.

Bristol North District Medical Society

April 18, 1929—Spring meeting.

Essex North District Medical Society

May 1, 1929 (Wednesday)—Annual meeting at Lawrence, at 12:30 P. M.

May 2, 1929 (Thursday)—Censors meet at Hotel Bartlett, 95 Main Street, Haverhill, at 2 P. M. (Tel. 3430.)

Essex South District Medical Society

February 6, 1929 (Wednesday)—Council meeting, Boston.

February 13, 1929 (Wednesday)—Danvers State Hospital. Clinic at 4 P. M. Supper at 6 P. M. Speaker: Dr. Roger Lee, Boston; subject to be announced later. Discussion from the floor.

March 6, 1929 (Wednesday)—Lynn Hospital. Clinic at 5 P. M. Dinner at 7 P. M. Symposium on Pneumonia. Speakers: Dr. Reginald Fitz, Diagnosis. Dr. Fred Lord, Treatment. Dr. William H. Robie, Heart in Pneumonia. Discussion from the floor.

RALPH E. STONE, M.D., Secretary.

Franklin District Medical Society

Meetings will be held on the second Tuesday of March and May.

Hampden District Medical Society

The next meeting will be held January 22. Additional notices will appear later.

Hampshire District Medical Society

March 13, 1929—Address by Dr. George E. Gage, Professor of Bacteriology and Physiology at the Massachusetts State College.

Middlesex East District Medical Society

The following schedule of meetings has been arranged for the coming year:

January 16—Wakefield.
March—Reading.
May—Melrose.

Subjects and speakers to be arranged by committees in each city or town.

Middlesex North Medical Society

The winter meeting will be held the last Wednesday in January.

The annual meeting will be held the last Wednesday in April.

Middlesex South District Medical Society

March 27, 1929—Joint meeting with the Suffolk and Norfolk Districts.

April, 1929—Annual meeting. Definite date to be announced later.

Norfolk District Medical Society

Below are the proposed meetings of the Norfolk District Medical Society for the 1928-29 Season. The schedule below will be adhered to as strictly as possible. The carrying out of the proposed plan will, of course, depend upon the acceptances of invitations extended to the speakers. Minor changes may be necessary.

January 29—Roxbury Masonic Temple. Subject, Treatment of Varicose Veins by the Injection Method—Dr. E. E. O'Neil. Dr. Homans will open the discussion.

February 25—Roxbury Masonic Temple. Dr. W. R. Ohler. Subject to be announced. Discussion to be opened by Dr. A. A. Hornor.

March 29—Roxbury Masonic Temple. Subject and speakers to be announced.

May—Annual meeting program to be announced.

The Censors of the Society meet May 9, 1929, at the Roxbury Masonic Temple, Warren Street, Roxbury, at 4 P. M., for the examination of candidates.

Plymouth District Medical Society

January meeting, Thursday, January 17, 1929, at 11 A. M., Brockton Hospital, Brockton, Mass. Speakers: Dr. Michael F. Fallon, Chief of Surgical Staff, St. Vincent Hospital, Worcester, Mass.; Dr. Edw. J. Denning, Chief of Medical Staff, Carney Hospital, Boston, Mass.; subject to be announced later.

March meeting at the Moore Hospital, Brockton, Mass., March 21st, program to be announced later.

April meeting at the Commercial Club, Brockton, April 18th, at 6 P. M. Annual Oration by Dr. Ralph C. McLeod, Orator; dinner.

Suffolk District Medical Society

March 27, 1929—Meeting in association with Middlesex South District Medical Society. "Clinical and Experimental Studies of Obstructive Jaundice and Its Complications," Dr. Waltman Walters, Mayo Clinic.

April 24, 1929—Annual meeting. Speaker, Dr. Walton Martin, New York City. Title to be announced later.

LINCOLN DAVIS, M.D., President.
ARTHUR H. CROSBIE, M.D., Secretary.

Worcester District Medical Society

February 13, 1929—Worcester State Hospital. Program to be announced.

March 13, 1929—Worcester City Hospital. Dedication of New Nurses' Home. Speaking program to be announced.

April 10, 1929—Grafton State Hospital. Program to be announced.

May 8, 1929—Annual meeting. Worcester Country Club.

Worcester North District Medical Society

January 22, 1929 (Tuesday)—At Henry Heywood Memorial Hospital, Gardner, by invitation. Program by Staff.

Annual meeting the fourth Tuesday in April.

BOGUS CANCER CURES IN ENGLAND

England is suffering from an epidemic of so-called cancer cures—a social problem which also confronts the United States and other countries.

According to a detailed account in the British publication, *Better Health*, these bogus cures vary in character but have certain general attributes in common. For instance, in practically every case the unsuspecting victim is offered a free booklet, so worded that he may easily be beguiled into the belief that he has symptoms of cancer and consequently suffers much mental anguish until he is enlightened by someone who knows the facts. Then, there are the testimonials—scores of them in each instance—all with names and addresses and some actually including sworn affidavits.

Those documents may be divided into three classes: First, the purely bogus ones, with fictitious names and addresses, as may soon be ascertained if any communication is attempted. Second, the testimonials that are written in good faith by honest persons, but which contain incorrect diagnoses—in other words, those from persons who have non-malignant growths, not cancer. And third, the testimonials obtained under false pretences by glib tongued agents. The victims of such methods apparently do not consider the fact that if any of the "cures" were genuine no advertising of this kind would be necessary, as the whole world would acclaim the discovery after due investigation by the medical profession.

The specifics employed in these false cures evidence considerable ingenuity. They consist of oils, ointments, plasters, lotions or pills, or a combination of these, always accompanied by some statement of their remedial powers calculated to impress the patient. Some of the prescriptions are simply vegetable extracts whose elements cannot be identified. British chemists who have analyzed a large number of such products have found that cottonseed oil is the chief ingredient of the oils. Some of the lotions contain a little cocaine, for its numbing effect. Alcohol is usually found in mixtures to be taken internally, and sometimes a small amount of opium. The pills prescribed are of the ordinary purgative kind, or else contain iron with soda or potash, while the ointments are mostly vaseline, suitably colored. In one case, a plaster was composed of china-clay and oil. In every instance the charge was exorbitant and totally unrelated to the value of the ingredients supplied.

The comparative immunity from punishment of such charlatans in England is attributed to the fact that the machinery of the law is too slow to catch them, as they disappear at the first sign of trouble and leave no trace of their whereabouts.—*American Society for the Control of Cancer, Inc.*

BOOK REVIEWS

A History of Pathology. By ESMOND R. LONG, PH.D., M.D., Baltimore: The Williams & Wilkins Company, 1928. pp. xxiv + 291.

This splendid book is very welcome to all physicians and teachers of medical students. The historical approach to the study of disease, so firmly inaugurated in this country by Osler in his medical wards and "Textbook of Medicine", is now being expanded to a more detailed study of the various branches of medicine. This is the "first definite and systematic account of the subject (pathology) in English".

Dr. Long, professor of pathology at the University of Chicago, has divided his subject into twelve chapters, beginning with the "pathology of antiquity" and ending with the latest advance in "experimental and chemical pathology". The writing is brilliant, with every original source investigated, classical papers quoted from and most instructive illustrations used, including portraits, pictures of important laboratories and drawings from the author's articles. One even finds a facsimile of one of Rokitansky's protocols and a page from Benivieni's classic! Here is medical history written in a way which would have delighted the heart of Osler.

The book is eminently worth-while. The high standard set by the publishers in previous books has been adhered to. As Garrison says in the foreword, "This book can be cordially recommended to any physician who wishes to know the origins and evolution of the basic discipline of scientific medicine."

The Kahn Test. By R. L. KAHN, M.S., SC.D., Director of Laboratories, University of Michigan Hospital, Ann Arbor, Michigan. Published by Williams & Wilkins Company, Baltimore, December, 1928.

The Kahn test is at present widely employed as a serological procedure in the diagnosis of syphilis. In a small number of laboratories, it is the sole procedure; in the majority, it is used in conjunction with a complement fixation test, usually the Wassermann. It seems, from a review of the literature on the subject and from clinical observations of the reviewer, to be slightly more sensitive in at least those cases of syphilis having received or undergoing antisyphilitic treatment.

The test embraces the employment of three agents: blood serum, antigen consisting of an alcoholic extract of powdered beef heart muscle and physiological salt solution. The result of the test is based entirely on the phenomenon of precipitation, an extended presentation of which appears in the first chapter. The facility with which it is carried out, renders it a most applicable tool for research.

The above treatise is well written, is printed in excellent fashion and possesses an all-embracing and comprehensive bibliography. It is indispensable to laboratory worker since it presents the technical aspects of the Kahn test in precise detail. In order that the physician may clinically interpret the method in a satisfactory manner, it is necessary that he possess some general idea of the method. To the latter the book is highly recommended as being the most complete work on the subject.

Keeping Mentally Fit: A Guide to Everyday Psychology. By JOSEPH JASTROW, PH.D., LL.D. New York: Greenberg, 1928. xv + 315 pages.

This book, in popular journalistic style, has its basis in a thorough knowledge of modern psychology. The author is often amusing as well as informative. Whether one would be more "mentally fit" or not, by reading the book, is beside the point. The psychologist, as opposed to the psychiatrist, has a tendency to be over-optimistic, perhaps, in estimating the value of mental hygiene. One doubts if the course of mental disease is ever stopped or even much deviated or shortened by an adherence to the principles described in the book. Nevertheless, because of the great demand on the part of the public for popular expositions on psychology, books of this character are written, and well written, to tell people how to "keep happy," "choose and hold a job", or even when and where not to "spank the child."

Regional Anesthesia. By GASTON LEBAT.

It is safe to say that the second edition of this well-known work will have a favorable reception by the profession. As stated in the introduction,— "Complete revision has been made of the whole text, desirable alterations and valuable additions being prompted by the experience acquired in many more years of research, teaching and practice. . . . The chapter on spinal anesthesia has been entirely re-written." The book impresses one as being distinctly a practical treatise, the methods in general being set forth in great detail. The same detailed presentation is made of the procedures to be carried out in the different regional fields and the exact methods of blocking the different nerves. The concise and clear descriptions are greatly aided by numerous illustrations which are excellent in all respects.

One is struck by Dr. Lebat's conservative claims for regional anesthesia. His statement that to carry it out with any degree of satisfaction requires considerable knowledge and constant practice is one with which all surgeons of experience will agree. The book is certainly to be recommended for the libraries of all practising surgeons.